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Government Reorganization and the Commission

Some of his utterances indicate plainly that President Roosevelt is still determined to reorganize the executive branches of the government, including presumably the Interstate Commerce Commission. When the proposal of shaking up this venerable body was first broached many eloquent speakers sprang to its defense—especially to defense of its freedom from presidential interference. Most individuals or bodies, when placed on the spot as the Commission was, might have been expected to become alert to avoid just occasion for criticism. The Commission has acted quite to the contrary. It has done about everything it could during the last year and a half to destroy confidence in its ability and disposition, as at present constituted, to contribute its part toward assuring "adequate and efficient railway transportation service" to the American public. The administration could not safely overlook its shortcomings even if it were disposed to do so.

The Commission has been in existence more than fifty years. It has had power of effectively regulating rates, and thereby railway gross and net earnings, for more than thirty years. The railroad industry has been, and still is, more regulated than any other industry in the country. Also, it is in the worst condition of any industry. The Commission cannot be held solely responsible for this; but there is plenty of discredit to divide; and a very generous part of it belongs to the Commission. It has had extraordinary power, freedom and independence. It has had a duty to the public to use its utmost intelligence and courage to prevent any such railway situation as the present from developing. That it has developed affords no evidence of the Commission's intelligence and courage.

The Commission's Repeated Bad Guesses

It made a guess toward the end of 1936 that general business and railway traffic would continue to increase and abolished the "emergency" freight charges, thereby depriving the railways of freight earnings of more than a hundred million dollars a year. This was by no means its only or first important wrong guess. It should be obvious to every student of economics that freight rates should be regulated largely in accordance with changes in prices because changes in prices directly and indirectly have so much effect on railway expenses. The Commission began disregarding changes in prices in its regulation of rates by its decision in the rate advance case in 1911; and it has been doing so ever since. Because of its repeated failures to allow advances in rates when prices were advancing, it has had repeatedly to allow advances in rates when prices were falling, the latest example being in 1938—a plain reversal of sound economic policy. But it always has taken such meticulous care to avoid making rates too high that during every considerable period for almost thirty years they always have been too low. This has been one of the principal reasons why in years of both prosperity and depression the railways have been steadily drifting toward their present condition.

It is all very well to make eloquent pleas for keeping the Commission "independent." The important thing is that it shall use its independence to act with intelligence and courage in behalf of maintenance of "adequate and efficient railway transportation service" to the American people. Better have a Commission that is not independent, but that acts with intelligence and courage, than one which is independent but fails to so act. We have had the latter. Therefore, this paper has been unable to join enthusiastically in the encomiums of the Commission inspired by the President's proposal to include it in reorganization of the executive branch of the government.

The Commission's Primary Responsibility

The Commission plainly has no consistent philosophy of its functions. At one time it seems to understand its duty to maintain adequate and efficient transportation. At another it appears to lose sight of that duty altogether in its desire to keep down rates, or to maintain at all costs its control over the minutiae of rate-making. It is this lack of a philosophy to harmonize Commission action with the national interest which makes it vulnerable to attack. No national administration wants to go before the electorate in a presidential year with a broken-down railroad system about its neck. It must at least make some effort to avoid that eventuality. Is the Commission showing any appreciation of the administration's problem—or is it so concerned with main-

taining its prerogatives that it does not see that these prerogatives and even the Commission itself are only a means to an end—and not an end in themselves?

The learned members of the Commission are about to leave Washington on their annual holiday. May we suggest that they forget all about Fourth Section relief, reparation cases and the multitude of details which plague them most of the year, and spend their time in meditation on the following text:

And seeing a fig tree by the way side, he came to it, and found nothing thereon, but leaves only; and he said unto it, Let there be no fruit from thee henceforth for ever. And immediately the fig tree withered away.

The "leaves" which the Commission has sprouted in profusion are the detailed regulation of rates. The "fruit" which it has not borne is a healthy transportation system. There is mighty little use for elaborate machinery to regulate rates if the transportation system under regulation is permitted to wither away. The Commission, apparently, senses this fact at times and forgets it at others. Its wabbling is well illustrated by its recent handling of the freight and passenger rate increase cases.

Commission Wabbling in Recent Cases

In denying last March the railroads' plea for an increase of 15 per cent in freight rates, the Commission stated that such rates would "be such a deterrent to traffic as to stifle movement." A few weeks ago, in authorizing the Eastern railroads to increase their coach fares by 25 per cent, the Commission expressed its doubts "whether or not applicants can obtain greater revenue from the proposed fare basis than from the present basis." Nevertheless, in the latter case it conceded that "every reasonable opportunity should be afforded" to the railroads to increase their revenues, and hence that "the fare basis proposed by applicants should be given a trial."

The Commission thus exercises a fine self-restraint in refraining from supplanting the opinion of railway management with its own in a relatively inconsequential aspect of the rate structure, while adhering to its ruinous interference with managerial discretion with respect to freight rates where greater tolerance on its part might save the railroad industry from general bankruptcy. It is like the old story of the hard-shelled Sunday school superintendent who would sooner perish than smoke a cigarette or touch a drop of liquor, but was pretty liberal with himself at the till of the local store where he kept the books. Virtuous in small things, free and easy in the large.

Every argument which could be made in favor of the 25 per cent increase in Eastern coach fares applies with even greater force to the freight rate increase of 15 per cent which the Commission shaved down to a bare 5 per cent. In the freight rate decision the increase the railroads sought was denied, for one reason, because the Commission believed that the proposed increases would "stifle movement." In the passenger rate case the Commission was unconvinced that the proposed higher fares would provide greater revenue, but concluded that the railways should be given the chance to take the risk, their need for greater revenues being so acute as it is. By what principle is it concluded that railroad managements should be allowed to find the passenger rate which will give them the greatest revenue, while they should be denied the opportunity to establish freight rates for the same purpose?

Can a Few Managers Be Right, and All of Them Mistaken?

The inconsistency of the Commission's handling of the two cases is even more glaring than appears on the surface. Railroad managements were virtually unanimous in their belief that higher freight rates would provide them greater revenues, while it was only the managements of the Eastern roads (and probably not all of them) who foresaw benefits from higher passenger fares. Managerial discretion in rate-making is thus approved when it is somewhat less than unanimous, and when it applies to a small part of the rate structure, but denied when it is wholeheartedly unanimous and applies to the rate structure as a whole.

Managerial discretion in rate making (when the question is solely one of securing adequate revenues) is either sound or unsound. It cannot be the one in the case of coach fares and the other in the case of freight rates. We know of no competent student of public service enterprises who would concede that, in the present financial condition of the railroads, the Commission could soundly substitute its own opinion for that of railway management in either the freight or passenger rate cases and certainly no one bound by the rules of logic could think up any excuse for its imposition of its views in the extremely important case and not in the comparatively unimportant one.

It is very questionable whether the Commission has either the moral or the legal right, as long as railway earnings are far below a reasonable return on the investment, to act to depress the rate level below that which responsible railway managers wish to establish. But if it is going to exercise that power, whether the right exists or not, then it becomes necessary to examine its diagnosis of the probable effect of rate increases. In the freight rate case it was quite positive that a 15 per cent increase "would be such a deterrent to traffic as to stifle movement," whereas it was wabbly in its views as to whether an increase in passenger fares substantially larger than that sought in freight rates would curtail revenues.

Higher Freight Rates or Higher Fares?

Now a little elementary economic analysis could have shown the Commission that a passenger journey is an

article of final consumption, whereas a freight haul is only a part of the process of producing a commodity and delivering it to the ultimate consumer, and that therefore any given percentage advance in freight rates is almost certain to be a much smaller deterrent to traffic than an equal advance in passenger rates. In 1936 only 6.19 per cent of the delivered price of a dozen eggs was represented by freight charges. Suppose the eggs were selling at 40 cents a dozen and freight rates were increased 15 per cent—the selling price of eggs would rise by only a little more than ⅓ cent per dozen.

By contrast, a 25 per cent increase in passenger fares falls entirely on the consumer. A coach ticket from New York to Chicago under the new rates will cost $4.49 more than at the 2-cent rate—a boost from $18.20 to $22.69. How the same group of men can figure (as they did in effect in denying a 15 per cent freight rate increase) that ⅓ cent added to the price of a dozen eggs will "stifle traffic" while a 25 per cent boost in passenger rates may bring an increase in revenue, is unfathomable to us.

The responsible railway traffic officers who believe they will garner more revenues at 2½ cents a mile than at 2 cents certainly ought to know more about their business than we do—or than the Commission. But how the Commission can extend at least qualified belief to their views, and dismiss the overwhelming managerial opinion as to the probable effect of freight rate increases, just cannot be explained.

Should the Administration "Interfere?"

The American people have every right to demand of their government that it make it possible for private enterprise to supply them with an adequate and economical national transportation system. The national administration has not only the right but the duty to examine critically every federal agency dealing with transportation to see whether it is helping or hindering in the achievement of that goal. Has not the Commission, by its action in the Eastern fares case, virtually confessed its mishandling of the freight rate increase case? The amount denied to the railroads in the freight rate case was some $400,000,000—enough to spell the difference between financial life and death to the industry. How can the administration overlook this failure by the Commission—and how can it be blamed for advocating any changes in the Commission's set-up which will require it to put the national interest in an adequate and economical transportation plant ahead of its frantic concern for the maintenance of its detailed prerogatives?

Will Furloughed Men Back the "Old Heads" in Their Refusal to Take a Wage Cut?

"Some of the more indiscreet of the furloughed men have told the old men in plain words, that there is no use to ask the young men to co-operate with them, if they strike over the proposed wage cut, and have further assured them that there won't be a train delayed in this territory. They shouldn't have told them that until after the strike was called.

"The young men in this area don't feel towards the railroads like a lot of the old men do. We know that our bread and meat depend on the success and prosperity of our employers.

"We wish them all the luck in the world and are heartily ashamed of the statement made by Mr. Harrison of the Association of Railway Labor Executives that, 'We wouldn't give the railways the whiskers from yesterday's shave'. He certainly was not speaking for the vast army of furloughed men when he said that.

"Recently the labor executives asked the railways to withdraw their request for a wage cut and asked that they might go along with the President's plan for recovery and get men back to work. Why didn't the railway executives ask them 'How many men have *you* put back to work?' The brotherhoods are perfectly willing to put all the men back to work that the railways will bear *all* the expense of, via the car limit bill or by some other method that won't cost the old heads a penny.

"We believe that the old heads and the brotherhoods are deliberately retarding recovery by their long drawn out arguments over the wage cut.

"The sooner the railways get back on their feet, and put their shop men back to work and come back into the market for material and equipment the sooner we will be returned to work and the whole nation will be benefited by it.

"If you publish this letter, credit it to 'A former railroader whose job has been sacrificed in order that the old men may make from $300 to $350 per month'."

A letter from a Furloughed Employee

Effect of R. R. Situation on Buying and Employment

Never before, probably, in history did changes in the railway situation within a single year produce such great adverse effects upon general business and employment in the United States as the changes that have occurred within the last year. The recession, resulting in freight loadings being 25 per cent smaller in the first half of 1938 than in the first half of 1937, was accompanied by an advance in wages that made them the highest in history.

In consequence, net operating income—the amount of gross earnings left after paying operating expenses and taxes—declined from $240,100,000 in the first five months of 1937 to $45,300,000 in the first five months of 1938, or 81 per cent.

As experience shows the net operating income earned principally determines railway buying from the manufacturing industry, it is not surprising that statistics published elsewhere in this issue of *Railway Age* show there was a terrific decline in buying of equipment and materials in the first half of 1938.

Purchases of equipment and materials (exclusive of fuel) amounted to $199,588,000. This compares with similar purchases of $544,503,000 in the first six months of 1937, a decline of $345,000,000, or 63 per cent.

Orders for equipment declined from $173,320,000 to $35,306,000, or 80 per cent. Orders for locomotives declined from 228 to 75; for freight cars from 45,090 to 8,024; and for passenger cars from 456 to 107. The value of materials received from manufacturers declined from $371,183,000 to $164,282,000, or 56 per cent.

Total buying from manufacturers in the first six months of 1929 was $885,000,000. Total buying from manufacturers in the first six months of 1937 showed a decline from this level of $685,000,000, or 78 per cent. The purchases made in the first half of 1938 were smaller than in the first halves of the depression years 1931, 1934, 1935, 1936 and 1937, but larger than in the first halves of 1932 and 1933.

Total inventories of materials and supplies on hand have begun to decline. Because of the increase in buying in the early part of 1937 and the decline in the use of materials in the latter part of last year, due to retrenchment, inventories increased to $385,057,000 on January 1, 1938; but on June 1 they were down to $356,310,000. This was $116,000,000 less than in 1929 and almost $29,000,000 less than on January 1, 1937.

Purchases of fuel also declined in the first half of 1938. Total purchases of equipment, materials and fuel combined in the first half of 1937 were $690,091,000, and in the first half of 1938 were $313,152,000, a decline of $376,939,000, or 55 per cent.

While a good deal has been said about the decline of railway employment, the foregoing figures indicate it was no larger than the unemployment in other industries caused by decline of railway purchases. The number of railway employees in the first six months of 1938 was about 195,000 less than in the first half of 1937; while the figures given above indicate that decline of railway buying threw out of work at least 200,000 men in the manufacturing and mining industries. The changes in the railway situation within the last year apparently have, directly and indirectly, contributed a total of about 400,000 men to the list of unemployed.

Subsequent developments have shown the *Railway Age* was right when, in its issue of June 18, it interpreted railroad freight loadings as indicating that the decline in general business had stopped and that an increase had begun. Allowing for seasonal changes, freight loadings increased in every week from that ending May 14 to that ending July 9. At the bottom in the two weeks ending May 14 they were only 53.2 per cent of their average in the five years 1925-1929, inclusive. In the week ending July 9 they had increased to 57.4 per cent of that average, a gain, allowing for seasonal changes, of almost 8 per cent. But after this improvement they were still about 43 per cent smaller than in 1925-1929, and 26 per cent smaller than in the corresponding part of 1937 after their decline due to the "recession" already had begun. They were also almost 8 per cent smaller than in the same part of 1933, although 20½ per cent larger than in 1932.

Unless and until freight traffic gains much more than it has the railways will continue to be in dire need of reduction of their operating costs to enable them to make vitally needed increases in their buying of equipment and materials.

New Deal Economist Says Business and Labor Join in Unsound Policies

Following the lead of business and moved by the same natural motives, labor unions have learned to lay fewer bricks, and to lobby against railroad consolidation, so as to protect wage rates and jobs at the expense of production. The unions are no more to be blamed than the business men; they are driven by the pains of free competition to seek protection in organized restraint of trade. The action is natural, but it leads to scarcity and national poverty.

The organization of industry and labor left the farmers out on a limb. They were forced to sell in a market that had no regard for their cost of production, and to buy in a market that made no allowance for their buying power. Farmers were forced to adopt the principle of scarcity, and to co-operate under the A. A. A. to prevent production in an effort to protect prices. All that business men have to say at the Rotary Club about the absurdity of labor-union rules and of plowing cotton under is true so far as it goes. It is also true of well-organized industry, and industry started it.

David Cushman Coyle in the Virginia Quarterly Review

Wage Parleys Begun at Chicago

Railroads propose a 15 per cent reduction, showing that "purchasing power" would not suffer thereby

NEGOTIATIONS of the carriers' proposal to reduce wages 15 per cent were begun at Chicago this week, the Carriers Joint Conference Committee holding its first meeting with the Brotherhood of Railroad Trainmen on July 18 and its first meeting with the Railway Labor Executives Association representing all other brotherhoods, excepting the American Train Dispatchers Association and the Order of Sleeping Car Conductors which were not served notices of a reduction, on July 20. On July 18 and thereafter, the Carriers Conference Committee met with the trainmen in the morning and with the other brotherhoods in the afternoon. On the first three days, the meetings were devoted to outlining the position of each side.

The Carriers Joint Conference Committee reviewed the general railway situation, emphasizing the necessity for a 15 per cent reduction in wages. The material in "Railroads and Railroad Wages," a pamphlet compiled by the Committee for general distribution, was read to the representatives of the brotherhoods and the plight of the railroads was further established by excerpts from the report of President Roosevelt's railroad committee made in April. This report recommended, among other things, "that a reduction or temporary reduction in railroad wages and salaries such as was made in 1932, would be a means of very definite and positive relief to the carriers."

Wage Rates and "Purchasing Power"

In presenting the demand, the Conference Committee also contended that a wage reduction would not reduce purchasing power. It supported this contention with the following statement: "A reduction in railroad wages will mean no reduction whatsoever in purchasing power. The railroads spend their money as fast as they receive it. Because of lack of funds, every railroad in the country has had to reduce or cut out entirely many expenditures which otherwise would have been made to keep the properties up with the times. New cars and locomotives are vitally needed, not for expansion, but to increase efficiency of operation. New shop machinery and tools are needed for the same purpose. This need was emphasized in detail in the recent report made to President Roosevelt by the special committee of three members of the Interstate Commerce Commission which he appointed to analyze the present railroad situation. Nor does new equipment represent the only need.

"The railroads are just like an individual who has passed through a period of long and lean years. The house needs a coat of paint, the leak in the roof should be fixed, the broken window pane must be replaced, a new stove is needed in the kitchen, the living room rug is full of holes. There need be no fear of any loss of purchasing power because of a wage reduction. The money will be spent, and spent immediately. The main problem will be to determine which of the railroads' many pressing needs are the most urgent.

"A wage reduction will mean, of course, a certain shift in the distribution of this purchasing power. But this shift will only mean a partial return to normal conditions. While the purchasing power of regularly employed railroad workers is now 27 per cent greater than in 1929, the purchasing power of the railroad industry has been almost destroyed. In normal times, the railroad industry is one of the nation's biggest buyers, the most important customer of our basic industries. One of the principal causes of our present national situation is the forced reduction which has occurred in railroad purchases, and the virtual withdrawal, because of lack of money, of the railroads from our national markets. Nothing could do more to stimulate prosperity than an increase in railroad buying power."

Whitney Bases Case on Ancient History

The reply of the Brotherhood of Railroad Trainmen to the demand for a wage deduction of 15 per cent was a request that the demand be withdrawn. They opposed the reduction on the basis that the conference committee has not presented "facts which would justify the position you have taken," that "not a man on your committee has the courage to state that railroad workers are receiving more than a living wage," and that "before you can pay one cent of interest to the bondholders or one cent of dividends to the stockholders you must pay your workers a decent living wage."

In support of this position, A. F. Whitney, President of the B. of R. T., read a prepared statement which in part said, "When the Union Pacific was in the hands of receivers in 1893 an attempt was made to slash the wages of the railroad workers on the plea of poverty and inability to pay. The language of the court in reference to this wage matter applies to you gentlemen and to your employees as you seek to slash the wages of the railroad workers today. I quote: 'The court shares in their anxiety (that is, the receivers') to have an economical administration of this trust, to the end that those who own the property and have liens upon it may get out of it what is fairly their due, but to accomplish this desirable result, the wages of the men must not be reduced below a reasonable and just compensation for their services. They must be paid fair wages, though no dividends are paid on the stock and no interest paid on the bonds.'

"The story of financial juggling in the organization of the railroad companies of this country is a serious challenge to the honesty and integrity and the patriotism of the men who organized and manipulated these railroads. Millions and millions of dollars of these bonds and millions and millions of dollars of the stock issued in the organization of these railroads are still outstanding, and they represent no real value except graft and corruption.

Implies Insurance Companies Can Afford to Lose

"Again I quote from the opinion of Judge Caldwell in the Union Pacific case, as follows: 'It is a part of the public history of the country, of which the court will take judicial notice, that for the first $36,000,000 of stock issued this company received less than two cents on the

dollar, and that the net profit of construction represented by outstanding bonds was $43,929,328.34. There would seem to be no equity in reducing the wages of the employees below what is reasonable and just, in order to pay dividends on stock and interest on bonds of this character. Intelligence, bodily vigor and contentment are wanting among men who are compelled to work for inadequate wages. Sound public policy, no less than justice to the men, requires that they be paid a rate of wages that will enable them to live decently and comfortably, and school their children. Some corporations may pay their employees a less rate of wages than is here indicated, but a court of equity will not follow their bad example.'

"In the typewritten document submitted to me by Mr. Enochs there are several statements which demand an answer. In the opening paragraph of this statement reference is made to the life insurance policyholders of this country. The insurance companies of this country today have nearly one-third of the bonded indebtedness of the railroads, and yet this tremendous amount only represents 11 per cent of their total investments. They will tell you that if the railroads defaulted on every dollar of their bonds it would not in the slightest degree affect the rights or the interests of any policyholder in the nation, nor involve the solvency of our insurance companies.

"It is idle for you to complain about the increase in taxes as an excuse for cutting the wages of your workers. This government came to your rescue on your pension plan and saved you more than $30,000,000 a year on pensions which you had agreed to pay your workers.

"It is a well known fact that two of your outstanding railroads in the last eight years have lost over $500,000,000 gambling in bankrupt railroad stocks in this country.

Says Employees Will "Lose Their Homes"

"You admit that since 1930 you have paid to the bondholders of this country over $3,000,000,000 in interest, and that during 1937 you paid over $344,000,000 in interest to your bondholders. Under such conditions you ought not demand a wage cut and seek to force upon your men who operate your roads a wage standard that will compel them to lose their homes and deny them what every honest man in this country is entitled to—at least a living wage.

"To destroy the purchasing power of railroad workers by more than a quarter of a billion dollars a year will do nothing more or less than prevent recovery. Reduced buying power means the bankruptcy of the railroads of this country. You cannot and will not solve your problems by continuing to pay interest to the bondholders and by taking this money from the pockets of the railroad workers.

"As a further indication of the insincerity of the railroad's plea for wage deductions, let it now be recorded that, while total railroad wages were being reduced by more than half in 1933, as compared with 1929, the railroad bondholders received $22,000,000 more in interest in the bad year of 1933 than they received in the prosperous year of 1929."

Wage Negotiations Begun

On the third day, meetings with the trainmen had become a matter of "plate spinning or jockeying for position." During the first part of each session the Carriers Joint Conference Committee challenged statements made at previous meetings by the trainmen and during the balance of the session the trainmen continued the presentation of their case. Mr. Whitney maintained that the carriers should cooperate with the President of the United States and aid his recovery program by withdrawing the demand for wage reductions. The carriers contended that if it is a matter of cooperating with the President of the United States the trainmen should be consistent and accept the recommendation of the President's Committee which suggested wage reductions as a remedy for the railroad problem.

Money Not Spent on Propaganda, Says Committee

Another matter discussed on the third day was the trainmen's statement that "the Wheeler investigating committee disclosed the fact that approximately $189,000,000 of railroad money was spent in railway propaganda since 1920 which was largely designed to prevent remedial legislation and social service legislation in behalf of railroad workers." The Carriers Committee characterized the statement as "absolutely untrue on its face" for more than $63,000,000 of the expenditures went to joint freight weighing, inspection, and checking and collection bureaus; $15,000,000 went to joint bureaus for checking and collecting demurrage on freight cars; about eight million dollars were spent on the Car Service Division of the Association of American Railroads, and about fifty-seven million dollars were spent to maintain joint organizations for handling inter-line rate matters. Still other subjects were the establishment of group insurance and its effect upon turning employees from unions and bankers' control of railroads.

During the first three days, meetings were held with trainmen each morning, but after the meeting on July 20 the next meeting was scheduled for July 22. At the meeting with the Railway Labor Executives Association on July 20, the Carriers Joint Conference Committee presented the same material that was given to the trainmen on July 18.

At the time of going to press, it was anticipated that the presentation of the Carriers material would occupy the meetings of that day and the following day and that the railway labor executives would reply to the carriers demand on Friday or Saturday.

H. A. Enochs' Statement

As the meetings began on July 18 H. A. Enochs, chairman of the Carriers Joint Conference Committee, issued the following statement to the press:

"We of the Carriers Joint Conference Committee think we know the railroad men of this country very well. Most of us have served with them in one branch or another in railroading, and some of us in our time represented employee organizations in dealings with management. The majority of us served last year on a similar committee, which agreed to the employees' request for an increase in wages at a time when conditions were different from what they are today.

"We have confidence in the fairness and common sense of the railroad men. When they have all the facts before them they will recognize, we believe, how different is the situation today from that of a year ago when they sought and secured an increase in their rates of pay.

"All men now regularly employed on the railroads are receiving the highest average salaries in history, while thousands of their fellows are laid off and the investors are receiving next to nothing as a return on the savings they have put into railroad plant and equipment. We hope and believe that these facts will cause railroad men to realize the justice and necessity of the proposed reduction in wage rates."

Locomotive Axle Testing*

Results of fatigue tests on 11½-in. unrolled and rolled axles described at the June meeting of the A. S. M. E.

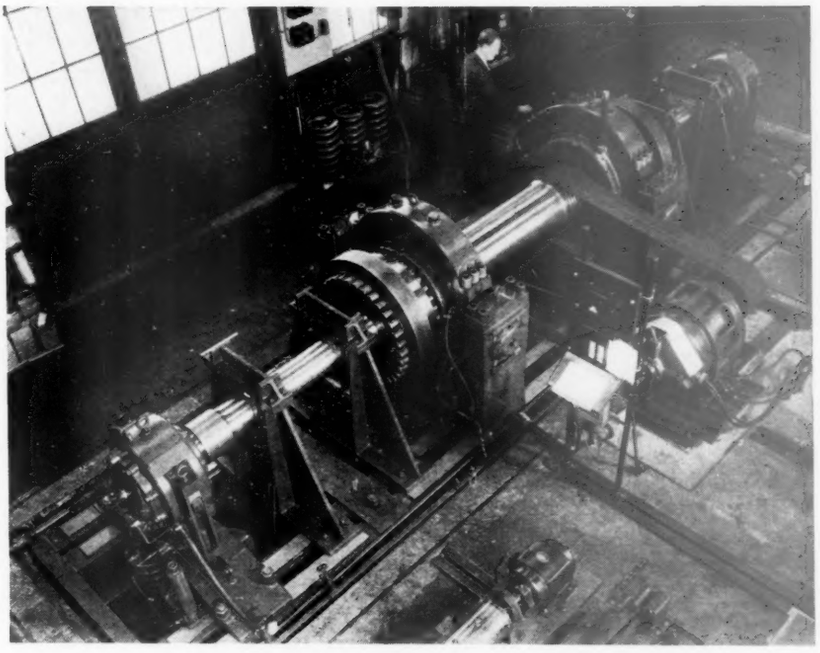

Fig. 1—Timken Testing Machine for Locomotive Driving Axles

IN view of the importance of fatigue cracks which develop in the wheel fit of axles in service, the Timken Roller Bearing Company initiated over a year ago a program of laboratory fatigue tests on outside-bearing electric-locomotive axles 11½ in. in diameter at the wheel seat. The machine used in making these tests is designed so that two axles may be tested simultaneously as cantilever beams at the same or different bending stresses, one test axle-and-wheel assembly being located at each end of the machine as shown in Fig. 1. Constant vertical spring load is applied at the journal end of the axle opposite the axle end on which the wheel is mounted. The entire axle-and-wheel assembly is bolted to a rotating flange by means of 34 bolts at the rim of the wheel. The journal end of the axle protruding beyond the pressed-on wheel projects into the test-machine spindle which is hollow bored; there is no contact between the spindle and the axle-and-wheel assembly except at the bolted rim of the wheel. A 100-hp. variable-speed motor drives the machine through an eight-strand V-belt connected to the central drive shaft located between the two rotating flanges to which the axle-and-wheel assemblies are bolted.

The accelerated test made with this machine produces axle fatigue fractures which have exceptionally close similarity to axle failures developed in service in that (a) the location and type of fatigue fractures in the wheel seat near the inside hub face in test axles are comparable with results in service; (b) initial development of a fatigue crack in test axles is produced at very low axle bending stress, but does not have appreciable propagation unless occasional high stresses are produced; a similar condition is found in service with ordinary speed equipment when magnetic examination is made of used axles before returning for new wheels; and (c) axles stresses at which the incipient fatigue cracks mentioned in (b) propagate to appreciable depth and then

Table I—Chemical Analysis and Physical Properties of Axles Tested

Chemical analysis:	
Carbon, per cent	0.24
Nickel, per cent	3.10
Sulphur, per cent	0.02
Phosphorous, per cent	0.03
Physical properties:	
Yield point, lb. per sq. in.	60,950-69,000
Ultimate strength, lb. per sq. in.	91,000-94,900
Elongation in 2 in., per cent	25.0-30.0
Reduction of area, per cent	67.5-70.6
Brinell hardness	192
Fatigue strength, ¼-in. diameter rotating beam, lb. per sq. in.	55,300

* Abstracted from the paper "Locomotive Axle Testing," by T. V. Buckwalter, vice-president, O. J. Horger, research engineer, and W. C. Sanders, general manager, railway division, Timken Roller Bearing Company. The paper was published in the May, 1938, issue of the A. S. M. E. Transactions and presented at the semi-annual meeting of the American Society of Mechanical Engineers at St. Louis, Mo., June 21, 1938.

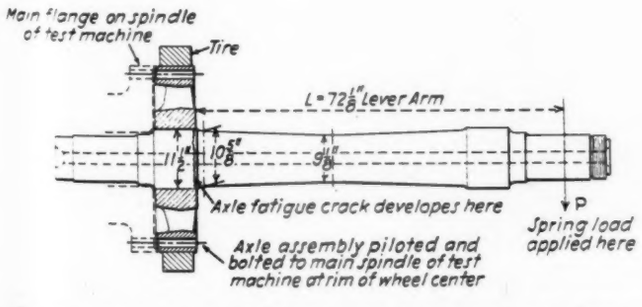
Main flange on spindle of test machine
Tire
L = 72 1/8" Lever Arm
11½"
10 5/8"
9 11/16"
Axle fatigue crack developes here
P
Spring load applied here
Axle assembly piloted and bolted to main spindle of test machine at rim of wheel center

Fig. 2—Details of Axle-and-Wheel Assembly Tested in the Fatigue Machine

Fig. 3—Fatigue Crack in the Wheel Seat of Unrolled Axle No. 9545

Test axle No. 9545 of 3.1 per cent nickel and 0.24 per cent carbon steel, normalized and tempered. The bending stress at the inside hub face was 19,000 lb. per sq. in. The axle was tested to 5,727,000 revolutions to failure, which is equivalent to 20,500 miles on 72-in. wheels.

to complete failure of the test axle compare favorably with service experience with high-speed equipment where higher occasional stresses would be experienced.

Description of 11½-In. Axles Tested

Fig. 2 is a line drawing of the axle-and-wheel assembly tested, which has dimensions identical with those of axles used in service. This is also true of the wheel, except the length of the spokes has been shortened; however, the sections of the hub, rim, spokes and shrunk-on tire are the same as used in service.

All the axles used for the tests were obtained from the same heat, and all axle forgings were given a normalizing and tempering treatment to produce the actual measured physical properties given in Table I, which also includes the chemical analysis. A 2-in. diameter hole was drilled through the center of all the axles. All axles assemblies were furnished by the Pennsylvania as shown in Fig. 2 completely machined, assembled and ready for test.

The cast wheel centers used were of A. A. R. grade C steel and were pressed on the axles in accordance with standard railroad practice. The mounting tonnages and diameter fits are given in Table II. A steel tire of 3¾-in. by 6-in. section was shrunk over each cast-steel wheel center after the center had been mounted on the axle as a means of nearly simulating the service assembly. The tire fit was 1/64 in. per ft. of wheel-center diameter.

Two uncompleted series of tests are reported in this paper, one series being on rolled axles while the other is on unrolled axles. The so-called rolled axles were surface-rolled (burnished) over the entire wheel fit portion before the wheel center was mounted on the axle for the purpose of investigating what increase in strength would result. In the rolling process the axle was rotated on lathe centers at 25 to 50 r.p.m. while the rollers were fed along the axle by the lathe carriage at the equivalent rate of about 28 threads per inch. The rolling device

Table II—Summary of Axle Fatigue-Test Data

Axle No.	Wheel fit on axle, in.	Wheel mounting tonnage	Axle bending stress, lb. per sq. in.	Life to failure: Number of revolutions	Life to failure: Equiv. miles	Max. depth of crack, in.
Unrolled nickel steel:						
9545*	0.017	162	19,000	5,727,000	20,500	4 9/16
9540*	0.016	152	14,000	19,850,000	70,600	13/32
9549*	0.016	135	12,000	28,680,000	102,200	2 3/64
9550*	0.016	170	10,500	83,730,000	298,000	1/16
Rolled nickel steel:						
9555*	0.0135	178	19,000	143,470,000	510,500	7/16
9553*	0.013	174	10,500	140,500,000	500,000	1/64
9554†	0.012	192	19,000	48,500,000	172,800	....
9542†	0.013	205	10,500	48,500,000	172,800	....

* Failed.
† Still being tested.

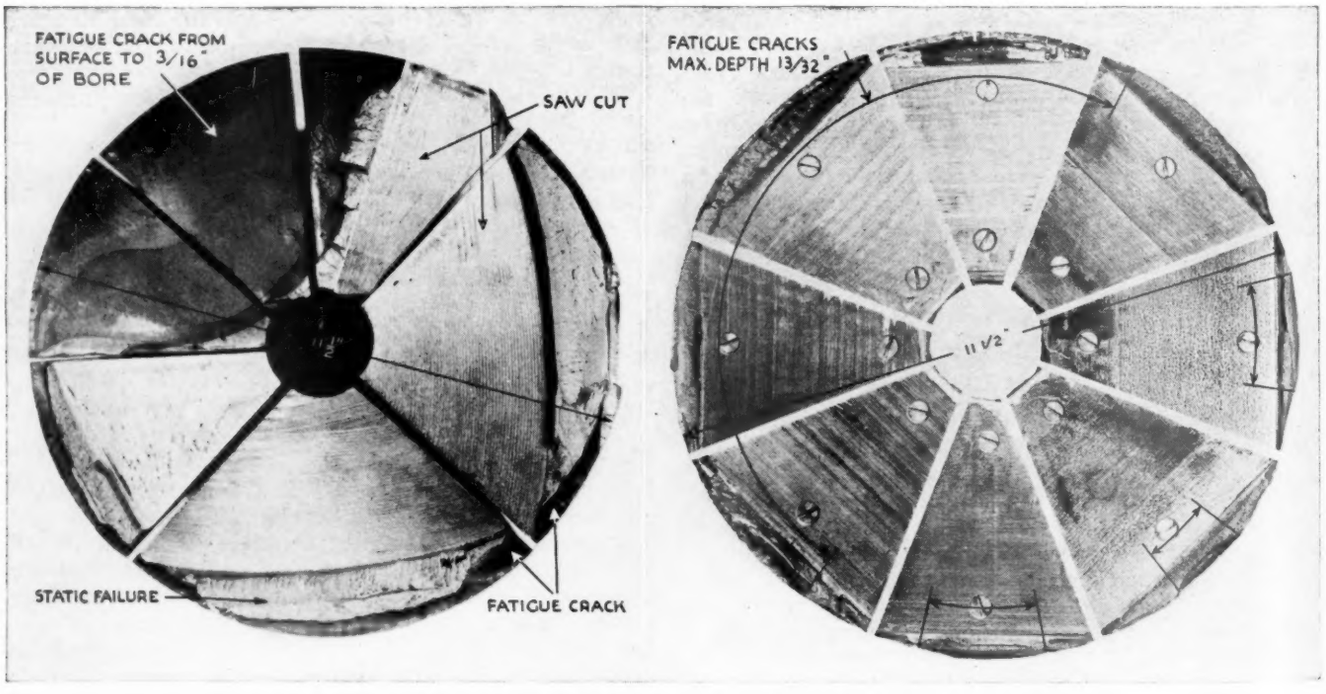

Fig. 4—Depths of Fatigue Cracks in the Wheel Seat of Unrolled Axles Nos. 9545 and 9540

Left: Depth of fatigue cracks in axle No. 9545 shown in Fig. 3; compare the depth of this crack with that developed in the rolled axles tested at the same stress, but with twenty-five times the life, as shown in Figs. 5, 6 and 7—Right: Cracks developed in the wheel seat of unrolled axle No. 9540 near the inside hub face; this axle like all the others was of 3.1 per cent nickel and 0.24 per cent carbon steel, normalized and tempered. The bending stress at the inside hub face was 14,000 lb. per sq. in., and was tested to 19,850,000 revolutions to failure, which is equivalent to 70,000 miles on 72-in. wheels.

Fig. 5—Fatigue Cracks Developed in the Wheel Seat of Rolled Axle No. 9555

Test axle No. 9555 of 3.1 per cent nickel and 0.24 per cent carbon steel, normalized and tempered. The bending stress at the inside hub face was 19,000 lb. per sq. in. The axle was tested to 143,470,000 revolutions to failure, which is equivalent to 510,000 miles on 72-in. wheels. The fit of the axle was completely lost except for 2 in. near the center of the wheel seat, but the dismounting pressure was 600 tons with the rim of the wheel heated.

consists of three rollers spaced 120 deg. apart and the pressure used was 25,000 lb. per roller. Roller dimensions were 10 in. diameter by 1½ in. contour radius.

The rolled axles were given a ground finish previous to rolling. The reduction in diameter due to rolling was 0.001 to 0.002 in. Axles other than those tested have been rolled using a smooth turned surface, and in such cases the reduction is 0.003 to 0.005 in. Since practically all this reduction takes place locally on the surface, the character of the machined surface controls the change in diameter due to rolling.

Table II gives a summary of the fatigue-test data for eight full-size axles. The illustrations of axle failures, all of which occurred within the axle fit, are shown in Figs. 3 to 8, inclusive. Some explanation may be necessary as to the manner in which specimens shown in Fig. 4 were obtained. A transverse slice was first sawed from the axle wheel seat containing the fatigue crack. This slice was then sawed into six pie-shaped segments, after which each segment was further sawed into the plane of the fatigue crack and the final separation developed by wedging apart the two portions of each segment through the saw cut. Therefore, Fig. 4 shows the saw-cut marks in the center of the axle, the area broken by wedging, and the fatigue crack developed in test which may be identified at the outer circumference of the axle.

Table III—Comparison of Rolled and Unrolled Axles

	Axle life		Maximum depth of crack, in.
Axle bending stress of 19,000 lb. per sq. in.:	Revolutions	Equivalent miles	
1—Unrolled	5,737,000	20,500	4 9/16
2—Rolled	143,470,000	510,500	7/16
3—Ratio of values in line 2 to those in line 1	25	25	1/10
Axle bending stress of 10,500 lb. per sq. in.:			
4—Unrolled	83,700,000	298,000	1/16
5—Rolled	140,500,000	500,000	1/64
6—Ratio of values in line 5 to those in line 4	1.7	1.7	¼

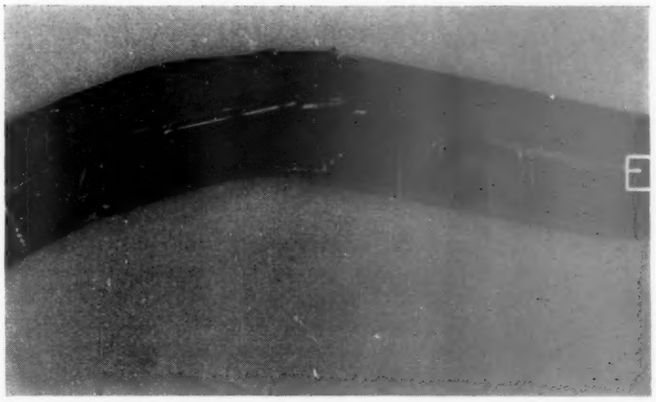

Fig. 7—Maximum Depth of Cracks in Axle 9555 Shown in Figs. 5 and 6

Maximum depth of cracks was 7/16 in. Note how the crack propagates at an angle of about 45 deg. with the surface. Compare these cracks with those in unrolled axle No. 9545 shown in Fig. 4.

Fig. 6—Segments from the Wheel Seat of Axle 9555, Shown in Fig. 5, Bent Slightly to Open the Cracks

The fatigue cracks run circumferentially in the axle shown in Fig. 5. The actual depths of the cracks are shown in Fig. 7.

None of the full-size axles were run until the axle broke off in the test machine, although unrolled axle No. 9545, shown in Figs. 3 and 4 (left), was very close to this condition. The fatigue crack extended from the circumference practically into the hole through the center of the axle.

A comparison between the test results of rolled and unrolled axles for the same bending stress is shown in Table III. While both kinds of axles developed fatigue cracks, the depth and propagation of the cracks in the rolled axle is much slower than in the unrolled axle. At the high bending stress of 19,000 lb. per sq. in., the crack in the rolled axle is only one tenth as deep after about 25 times the life of the unrolled axle. At 10,500 lb. per sq. in., the rolled axle had a crack about one quarter as deep after about 1.75 times the life of the unrolled axle.

The previously mentioned tests on rolled axles are now in the process of being checked by axles running in the machines at the present time as indicated in Table II.

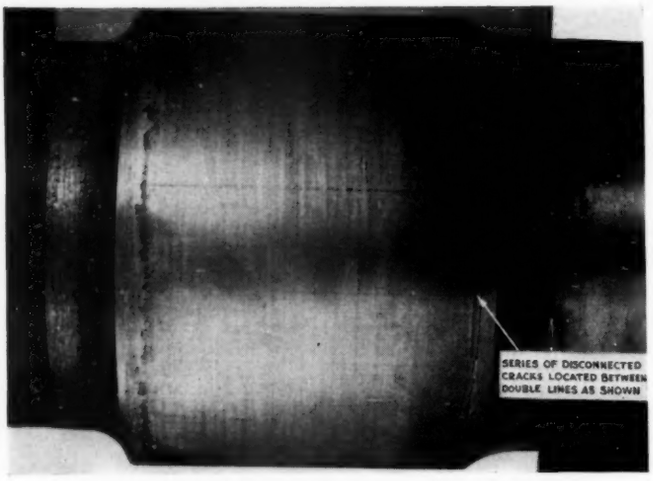

Fig. 8—Fatigue Cracks in Rolled Axle No. 9553

Test axle No. 9553 of 3.1 per cent nickel and 0.24 per cent carbon steel, normalized and tempered. The bending stress at the inside hub face was 10,500 lb. per sq. in. The axle was tested to 140,500,000 revolutions to failure, which is equivalent to 500,000 miles on 72-in. wheels.

While these check tests are not completed, they are sufficiently advanced to justify the feeling of similar improvement over unrolled axles.

The test of the rolled axle at 19,000 lb. per sq. in. represents a very severe test and one which will not be equaled under any service conditions inasmuch as the wheel entirely lost its fit on the axle except for about 2 in. near the center of the fit. This loss of fit is due to a mechanical action of rubbing corrosion caused by the minute sliding or molecular attrition of the axle in the wheel fit occurring during each revolution. The mutilated surface of the axle wheel fit is apparent from Figs. 5 and 6 and even though only about 2 in. length of fit remained, 600 tons pressure was not sufficient to press the wheel off the axle at the end of the test. It was necessary to heat the rim of the wheel and at the same time press on the axle to dismount the wheel at 600 tons.

Fig. 6 shows segments about 1¼ in. thick cut from the surface layers of the entire length of wheel seat of the axle shown in Fig. 5. These segments have been bent to open through the fatigue cracks. The depth of the fatigue cracks is indicated in Fig. 7. The development of the series of fatigue cracks shown in Figs. 6 and 7 instead of the usual single circumferential crack may be explained by the shortening of the wheel fit during the progress of the test.

The fact that the rolled axle also showed a crack at the low stress of 10,500 lb. per sq. in. checks with tests on 2-in. miniature axles which were run on a small machine similar in design to the one used for testing 11½-in. axles. It was found that the incipient fatigue cracks in rolled axles develop at a stress which is about the same as, or slightly higher than, the stress at which they occur in unrolled axles, but these cracks propagate at a much slower rate in the rolled axles.

Additional tests are scheduled for rolled axles at much higher stresses than used previously to simulate the effect of a large number of occasional stresses of high value in service.

The practical value of the rolled axle is that considerably increased strength is obtained over the unrolled axle and the liability of the axle breaking off in road service is reduced. As more test data are accumulated on full-size rolled axles, and if improved strength will be reflected comparable to that for 2-in. axles which were also tested, it is believed that the present typical mileage limit of 250,000 to 300,000 miles, at which driving axles are scrapped, may be increased to as much as possibly 500,000 to 1,000,000 miles, especially when rolling is combined with a higher raised wheel seat and possibly relief grooves in the hub of the wheel. The results of unpublished tests on unrolled axles, designed with a higher raised wheel seat than is reported in these tests, indicate that considerable improvement may be expected from this feature alone.

These tests on full-size locomotive driving axles are being continued and further progress reports will follow at a later date. It should also be mentioned that two additional axle-testing machines of the type shown in Fig. 1 are also in operation in laboratory of the Timken Roller Bearing Company since December, 1937, on tests of 5½-in. by 10-in. passenger-car axles. This latter program is under the direction of the Association of American Railroads.

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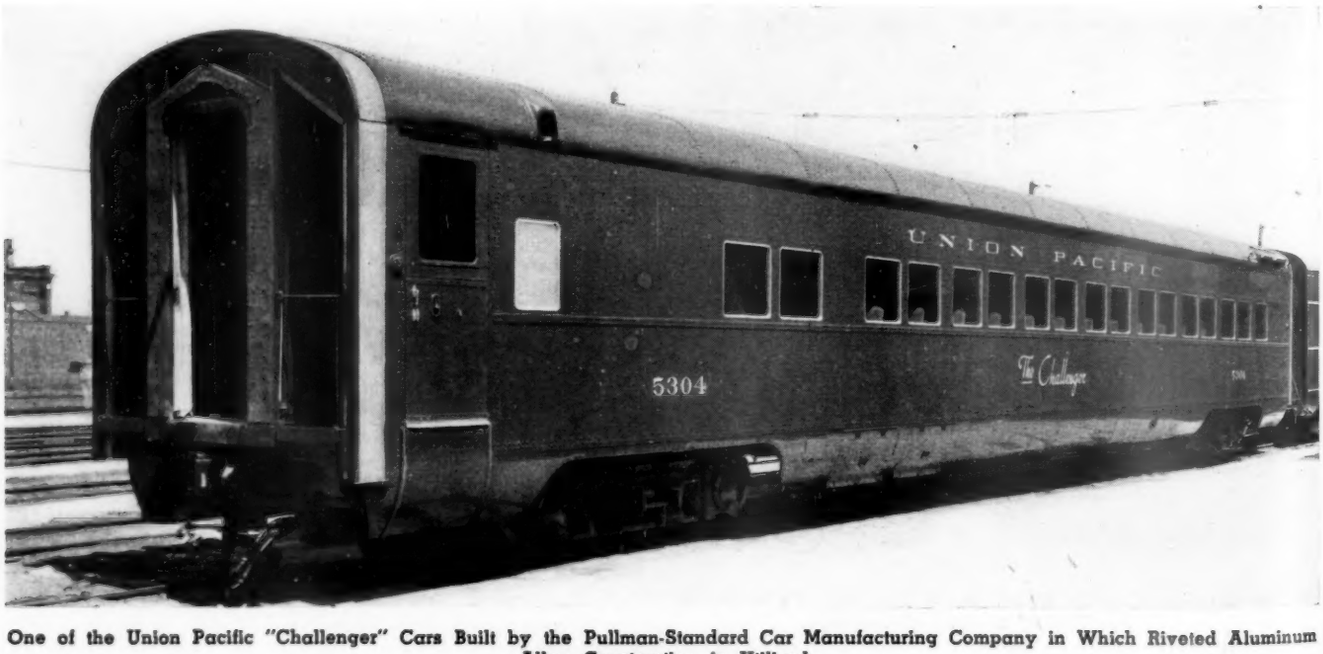


One of the Union Pacific "Challenger" Cars Built by the Pullman-Standard Car Manufacturing Company in Which Riveted Aluminum Alloy Construction is Utilized

Railway Inventories Under Liquidation

Last two months bring decline in stored material—Reduction since January almost $30,000,000

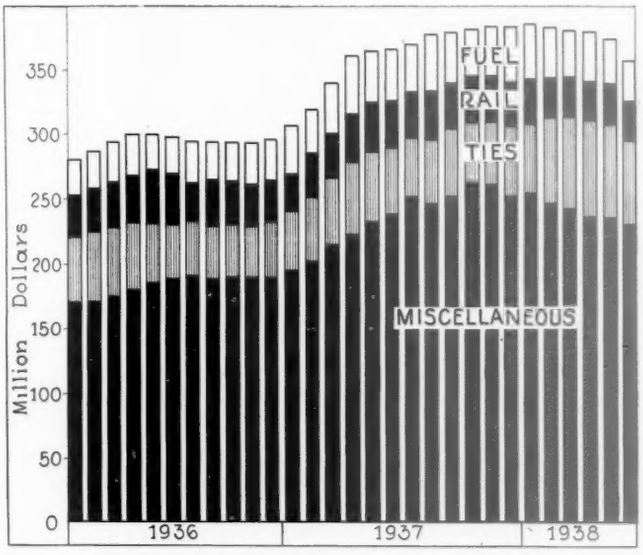
AFTER two years of violent gyrations in railway buying and consumption that threw much of the railway machinery for stock control out of adjustment and left supply departments with large surpluses on their hands, the surpluses have now ceased to pile up and inventories are definitely in process of liquidation. Total inventories of materials and supplies on the Class I railroads for each month from January 1, 1936, to April 1, 1938, as reported by the Interstate Commerce Commission, have been brought down to June 1 and subdivided to show the fuel, cross ties, rail, store stock and scrap on hand each month on the basis of reports to this paper by railroads carrying 70 to 85 per cent of the inventory of Class I roads.

The results are not uniform because of the irregularity with which the railroads have resumed work for which much of the surplus was accumulated. The figures are significant of conditions, however, since railroads do not (like merchants and manufacturers) write their inventory values up or down to suit their fancy but carry

Materials In Stock—Class I Railroads*

1936	Fuel (000)	Rail, New and S. H. (000)	Crossties (000)	Stores Stock (000)	Scrap (000)	Total (000)
Feb. 1	$22,721	$32,756	$50,056	$170,688	$5,569	$281,790
Mar. 1	23,398	34,168	51,906	172,836	5,569	287,877
Apr. 1	23,560	35,717	52,666	176,006	6,332	294,281
May 1	23,158	36,330	52,092	181,537	6,148	299,265
June 1	21,493	38,419	47,681	186,643	5,612	299,848
July 1	20,892	38,815	42,199	189,529	6,072	297,507
Aug. 1	23,401	31,971	43,522	191,463	4,963	295,320
Sept. 1	23,806	36,028	40,703	189,871	5,034	295,442
Oct. 1	24,532	33,988	41,818	190,224	5,114	295,676
Nov. 1	24,412	33,410	39,005	191,478	6,204	294,509
Dec. 1	27,953	31,375	42,125	191,618	4,631	297,702
1937						
Jan. 1	27,390	31,817	43,271	197,899	7,198	307,575
Feb. 1	29,039	32,778	49,675	203,064	5,805	320,361
Mar. 1	31,669	35,990	52,560	214,032	5,955	340,206
Apr. 1	*37,729*	38,316	55,424	223,903	6,079	361,451
May 1	32,693	*38,723*	54,342	233,540	6,172	365,470
June 1	31,735	37,644	51,205	239,159	6,857	366,600
July 1	29,185	35,329	47,427	251,760	7,857	371,558
Aug. 1	32,652	37,043	50,036	247,980	7,121	374,832
Sept. 1	32,619	35,819	51,595	253,583	6,810	380,426
Oct. 1	28,906	31,870	50,572	*264,689*	7,757	383,794
Nov. 1	28,411	31,769	53,040	262,604	8,552	384,376
Dec. 1	33,473	31,022	59,247	252,679	7,241	383,662
1938						
Jan. 1	30,499	30,333	59,015	255,714	*9,496*	*385,057*
Feb. 1	31,965	30,651	66,570	246,014	8,187	383,387
Mar. 1	29,289	31,105	68,996	244,573	8,088	382,051
Apr. 1	28,308	33,898	*73,705*	236,281	8,189	380,381
May 1	25,620	33,290	71,978	235,594	7,417	373,899
June 1	22,546	29,910	64,211	230,787	8,856	356,310

* Subject to revision.
High figures italicized.



Material and Supplies on Hand, Class I Railroads, January, 1936, to June 1, 1938

Materials and Supplies In Stock — January 1 and June 1, 1938

Railroad	Rail new and S. H. Jan. 1	Rail new and S. H. June 1	Crossties Jan. 1	Crossties June 1	Store Stock Ex. Scrap Jan. 1	Store Stock Ex. Scrap June 1	Total Including Fuel and Scrap Jan. 1	Total Including Fuel and Scrap June 1
A. C. & Y.	$11,228	$9,669*	$7,138	$32,964*	$78,616	$82,819*	$104,183	$132,312*
Alton	126,234	114,793	240,583	347,495	607,899	570,330	1,081,977	1,102,817
Alton & Sou.	19,420	27,886	2,160	5,094	46,573	59,100	91,303	96,413
Ann Arbor	15,904	12,309	48,951	8,658	192,902	180,509	330,651	216,524
A. T. & S. F.	3,481,940	3,286,614	6,938,822	7,777,937	12,721,410	11,569,877	26,113,501	25,381,181
A. C. L.	410,599	657,823*	464,047	753,640*	1,947,013	1,798,358*	3,915,240	4,208,148*
B. & O.	1,673,865	1,103,925*	1,260,289	1,287,414*	9,788,304	7,428,551*	13,207,543	10,003,320*
Bang. & Ar.	65,401	108,981	92,338	63,718	569,966	656,109	916,482	950,764
Bing. & Gar.	5,120	7,397	10,684	17,200	41,772	47,881	58,919	74,307
B. & Me.	231,715	259,605	971,565	835,438	2,409,703	2,155,961	3,911,350	3,407,596
Cambria	3,109	6,467	8,270	21,401	40,017	45,064	56,622	78,085
C. of Ga.	32,562	7,394	304,429	286,979	1,005,466	775,730	1,425,595	1,168,646
C. of N. J.	110,804	189,056	191,144	273,386	1,319,642	1,257,387	1,874,860	1,870,464
C. Vt.	43,522	46,336	100,208	135,801	394,758	369,987	640,562	628,432
C. & W. C.	12,857	11,248*	22,049	48,174*	114,417	150,571*	169,717	228,497*
C. & O.	Not separated		Not separated		Not separated		3,963,982	6,050,639
C. & E. I.	241,179	302,951	221,819	178,095	631,748	566,369	1,222,478	1,194,348
C. & I. M.	9,581	8,091	9,598	20,843	265,510	282,466	299,849	336,902
C. & N. W.	1,328,577	1,215,152	2,940,953	3,707,719	6,828,298	6,077,842	11,773,545	11,343,858
C. B. & Q.	651,327	939,617	3,012,767	3,140,639	6,117,644	6,575,027	10,702,539	11,497,415
C. G. W.	46,888	132,730	88,737	91,915	601,278	605,878	776,651	870,750

Materials and Supplies In Stock — January 1 and June 1, 1938 — Continued

Railroad	Rail new and S. H.		Crossties		Store Stock Ex. Scrap		Total Including Fuel and Scrap	
	Jan. 1	June 1	Jan. 1	June 1	Jan. 1	June 1	Jan. 1	June 1
C. I. & L.	$121,223	$112,941*	$183,785	$233,966*	$706,339	$690,810*	$1,098,984	$1,093,668*
C. R. I. & P.	369,864	952,641	1,162,150	1,243,119	5,112,888	5,487,040	7,402,663	8,330,037
C. St. P. M. & O.	307,529	280,984	413,989	546,201	915,316	877,599	1,729,821	1,748,434
Clinchfield	9,488	121,408	98,977	119,457	303,936	254,888	424,828	515,328
Colo. & Sou.	108,457	69,124	74,243	107,652	264,233	197,156	546,362	422,061
Col. & Green.	11,892	9,821	3,051	1,256	132,896	123,501	157,587	145,091
D. & H.	130,013	109,370	324,252	436,805	1,549,927	1,518,163	2,706,144	2,574,224
Det. & Mack.	12,681	11,492	27,712	26,104	132,433	141,064	179,270	183,232
D. & T. S. L.	6,178	5,999	21,582	20,266	72,348	78,671	108,793	112,590
D. T. & I.	47,823	59,631	131,961	128,016	354,471	355,146	559,263	557,395
D. M. & I. R.	74,957	144,627	243,559	397,456	646,764	594,624	1,625,997	1,639,263
D. S. S. & A.	41,685	40,910	17,480	46,467	160,672	180,937	243,398	274,090
E. J. & E.	28,272	90,797	47,437	112,020	864,570	772,974	1,049,502	1,077,582
Erie	223,119	133,265*	775,220	952,079*	2,285,942	1,912,525*	3,923,079	3,477,650*
F. E. C.	357,410	335,558	105,904	96,583	1,273,981	1,249,185	1,991,275	1,859,381
Ft. W. & D. C.	31,156	28,820	5,518	15,990	421,100	409,494	561,424	562,175
G. N.	749,937	706,267	1,055,185	1,924,567	5,908,640	5,321,699	9,117,606	8,764,456
I. C.	27,149	138,460	961,129	831,983	6,793,511	6,232,853	8,401,060	7,619,705
K. C. S.	176,384	150,224	325,193	375,496	593,261	616,680	1,388,201	1,482,453
K. C. Term.	10,774	9,836	31,670	47,990	144,812	144,438	207,952	215,518
L. S. & I.	56,715	55,645	7,338	23,427	150,163	137,190	315,539	294,256
L. & N. E.	71,931	55,073	41,762	34,128	196,726	169,306	400,074	296,539
L. V.	194,309	186,246	309,257	378,399	2,542,317	2,017,211	3,314,778	2,788,672
La. & Ark.	67,985	31,229	105,504	51,966	517,008	446,689	875,218	727,121
L. & N.	273,277	754,358*	1,905,155	2,025,935*	5,670,866	5,380,300*	8,804,451	8,858,990*
Me. C. & Port. T.	171,365	164,566	138,690	103,293	976,360	958,018	1,385,602	1,285,555
Soo	143,249	133,513*	145,099	308,530*	1,273,434	1,270,415*	1,753,247	1,926,858*
M. & St. L.	185,113	149,881	189,749	156,322	517,921	532,011	944,322	874,741
Mo. & Ark.	.....	3,058*	9,565	2,754*	52,132	50,153*	63,569	57,525*
M-K-T	95,719	79,327	501,967	308,036	1,755,717	1,640,725	2,492,233	2,098,169
M. P.	.....	.....	.....	.....	.....	.....	.....	.....
M. & O.	36,492	27,573	67,647	56,780	869,637	788,500	1,230,554	1,134,281
Monong.	12,516	11,517	9,130	33,935	183,750	190,749	207,398	239,315
Montour	1,128	21,478	1,012	9,710	140,252	135,902	149,056	175,256
N. C. & St. L.	77,502	240,725	288,722	296,061	1,117,170	1,096,794	1,684,995	1,716,512
Nev. Nor.	12,133	9,638	24,911	18,155	70,742	72,053	175,671	147,648
N. Y. C. Sys.	Not separated		Not separated		Not separated		33,111,142	31,753,362
N. Y. C. & St. L.	Not separated		Not separated		Not separated		1,848,382	1,632,315
N. Y. N. H. & H.	623,935	515,348	649,719	754,208	4,712,338	3,729,518	6,230,881	5,635,763
N. Y. O. & W.	37,377	23,773	67,854	56,464	447,935	390,219	623,727	536,553
N. P.	109,959	132,184	1,618,343	1,918,528	6,294,777	6,471,598	8,865,677	9,335,395
N. W. P.	75,057	67,092	37,234	43,841	94,622	73,749	247,983	225,118
Penna.	3,197,612	3,044,046	4,519,523	4,495,692	33,431,044	27,783,326	44,910,384	38,049,207
Long Island	210,993	197,151	22,143	29,873	1,179,032	977,803	1,475,526	1,237,376
P. R. S. S.	47,664	35,727	69,898	16,191	113,835	87,694	244,380	151,199
P. & P. U.	17,246	14,969	14,373	23,737	87,203	83,700	122,290	132,636
P. M.	Not separated		Not separated		Not separated		1,737,317	1,768,807
P. & S.	9,108	8,636	26,181	39,488	88,829	85,236	130,126	139,281
P. & W. Va.	61,793	54,525	13,417	7,189	402,853	454,079	491,461	521,704
P. S. & N.	24,550	18,877	3,292	6,907	48,130	58,182	83,164	91,718
Read.	311,757	544,905	452,994	625,418	4,488,890	3,893,919	5,784,062	5,284,924
R. F. & P.	Not separated		Not separated		763,347	782,328	835,295	853,582
Rutland	36,437	.....	71,168	.....	229,466	.....	399,734	.....
St. L.-S. F.	358,763	228,758	1,450,013	1,121,352	3,534,518	3,386,576	5,717,342	4,932,361
St. L. S. W.	200,370	186,686	319,384	339,843	1,120,271	935,927	2,174,270	1,952,889
S. A. L.	639,689	584,981	388,869	511,876	3,426,895	3,070,563	4,935,525	4,497,837
Sou.	290,917	396,219*	1,111,567	545,576*	5,754,995	4,989,032*	8,284,242	6,753,580*
S. P.—Pac. Sys.	664,719	1,029,537	2,254,969	2,138,929	7,918,167	7,120,349	13,535,989	12,196,484
S. P. & S.	52,005	47,805	181,787	208,640	507,406	462,174	842,480	842,823
T. C.	Not separated		6,188	4,851	268,422	248,401	279,463	256,778
T. of St. L.	4,285	52,877	1,748	17,194	450,621	398,978	551,325	510,084
T. & N. O.	466,917	574,660	857,728	649,078	2,470,118	2,294,606	4,817,774	4,538,566
T. & P.	349,249	292,121	366,913	364,542	2,557,404	2,376,046	4,291,456	4,054,466
U. P.	2,717,830	2,559,848	2,867,063	3,259,128	23,082,560	20,236,688	30,348,307	27,605,777
Utah	45,042	43,959	64,795	69,969	174,758	177,103	287,133	296,327
Va.	100,027	67,504	277,232	335,364	1,750,599	1,859,870	2,158,445	2,291,040
Wab.	425,803	400,917	418,834	448,261	1,825,866	1,689,421	2,833,165	2,620,580
W. Md.	6,619	43,245	458,111	522,981	1,113,434	1,117,355	1,798,220	1,799,833
W. P.	130,200	590,000	155,300	190,000	2,477,000	2,552,700	2,901,000	3,490,000
W. & L. E.	70,723	66,215	189,339	185,186	823,092	788,824	1,143,843	1,072,657

* May 1.

the materials on their books at cost until used or scrapped. They have also been writing off less inactive material than normally to keep their operating expenses down and it has been reported that the inventories of some roads in recent months have been further burdened with materials which have been returned to stock from the line of road, the effect of which is to slow up the liquidation.

$356,000,000 on June 1

Total materials and supplies on hand increased from $281,790,000 in January, 1936, to $307,574,000 on January 1, 1937, and reached a peak of $385,057,000 on January 1, 1938,—an increase of $77,483,000 during 1937 and an increase of $103,267,000 or 37 per cent in two years. This total declined to $380,381,000 on April 1, 1938,—a reduction of $4,676,000 from January 1. At the end of May it was down to $373,899,000,—a reduction of $6,482,000 from April 1, and it was down to $356,310,000 on June 1,—a reduction of $17,589,000 from May 1 and a reduction of $28,748,000 from January 1. The capital tied up in unapplied material on the Class I railroads on June 1, while still $74,520,000 more than in January, 1936, was less than in any month since March, 1937, and was less by approximately $116,000,000 than in 1929. On December 31, 1920, the year in

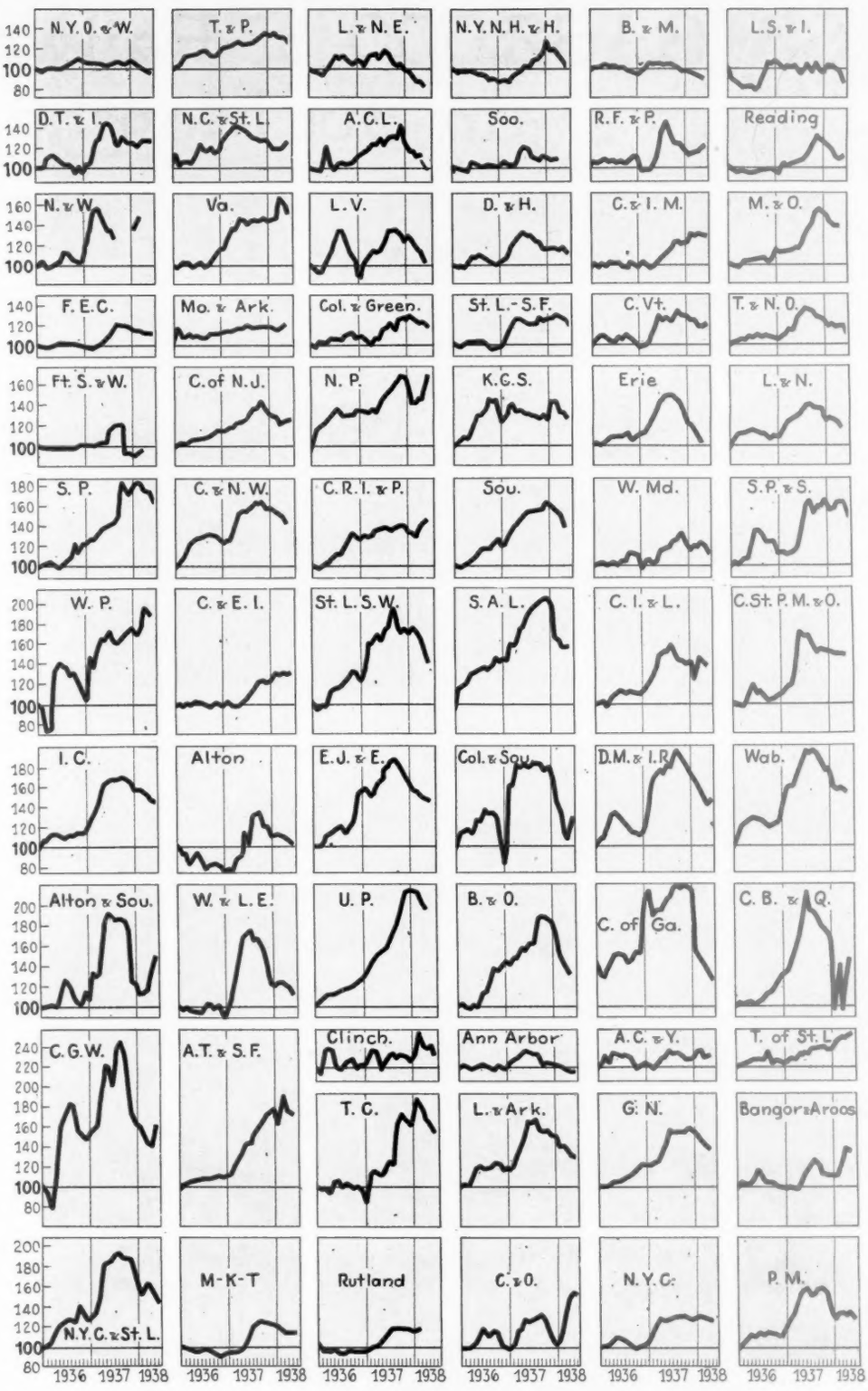
which the railroads were returned to private operation, the total inventory of unapplied materials of the Class I roads was $755,563,000.

Fuel on hand totalled $31,965,000 on February 1 and $22,546,000 on June 1,—a reduction of $9,419,000. Inventories of rail, which include relay and rail on rests as well as new rail, reached a peak on May 1, 1937, of $38,723,000, declined to $30,333,000 on January 1, 1938, and again increased to $33,898,000 on April 1, of this year. From that point rail stocks declined to $29,910,000 on June 1,—a reduction of approximately $3,988,000 in three months.

Stocks of cross ties, including ties at treating plants, increased from $47,427,000 in June, 1937, to a peak of $73,705,000 on April 1 of this year, since which time there has been an indicated decline to $64,211,000 on June 1,—a reduction of $9,484,000 in three months.

The largest changes were in the inventories of store house materials, which include materials for repairing locomotives and cars. These stocks were at their peak on October 1, 1937, when the total was $264,689,000, after increasing month by month from $170,750,000 in January, 1936,—a total increase of $93,939,000. From October, they declined to approximately $255,714,000 on January 1, 1938, and to $230,787,000 on June 1, representing a reduction of $24,927,000 in this class of stock since January 1, and of $33,902,000 from the peak in October, 1937.

Unsold stocks of scrap iron and steel declined from $9,496,000 on January 1, 1938, to $8,856,000 on June 1.

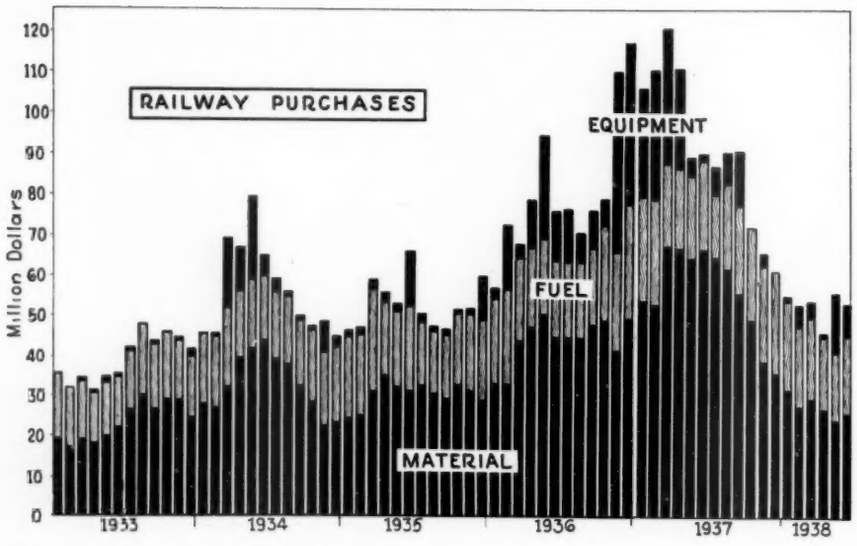


Inventories of Selected Railroads Compared. Fuel, Rail, Ties, and Scrap Excluded Except in Charts of N. Y. C.; P. M.; N. Y. C. & St. L.; and C. & O. January, 1936, taken as 100 in Each Case

Several roads made substantial reductions in their stocks of materials and supplies previous to January but 47 of 70 roads reporting June inventories had less rail on hand on June 1 than on January 1, 29 had fewer ties, 52 had smaller store stocks and 44 reported lower totals. In charts giving the trend of the inventories of store stocks on each of 72 railroads since January 1, 1936, the trend is down on 52 roads, with 12 roads operating on the volume on hand two years ago.

THE ARGENTINE GREAT WESTERN is selling cereal and linseed seed at reduced prices to farmers and ranchers along its lines; in addition it delivers the seed without charge for freight. This is being done, it is reported in Argentine dispatches, to stimulate the growth of crops in the area through which the road passes. Further efforts to encourage agriculture consist of the operation of an exhibition train to encourage the sale of seeds and furnishing of agricultural experts for consultation by all interested parties.

$313,152,000 of Railway Buying in Six Months



Sixty-Six Months of Railway Buying

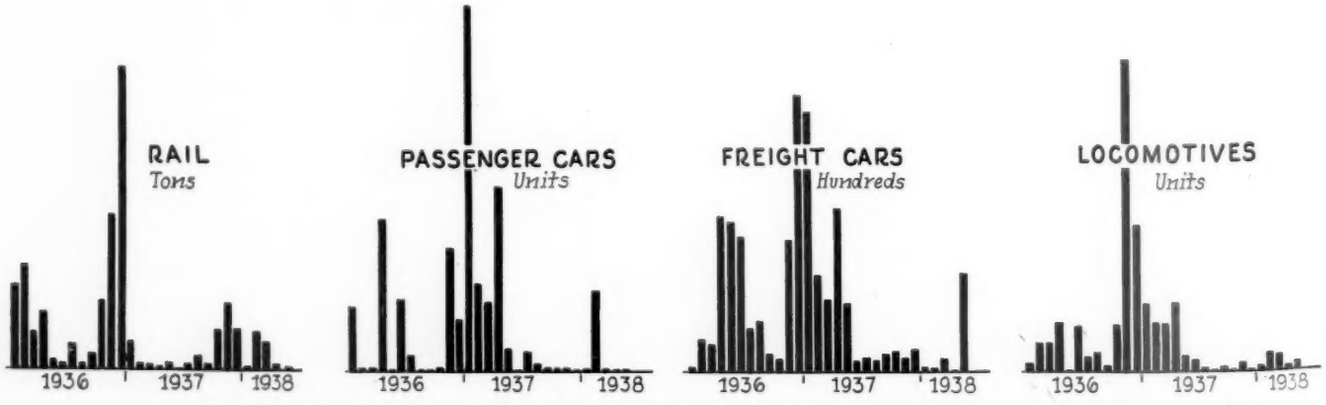
Smallest expenditure in six years,—Expansion due with resumption in maintenance and drop in inventories

THE *Railway Age* has compiled summaries of the purchases made by the railroads for the six months ending July 1, which show not only how hard the railroads and the railroad supply manufacturers have been hit by the business "recession" and other influences, but also that the railways buy in bad times as well as in good times. They also throw light on prospective business. Figures are based on special reports to this paper from almost all of the Class I roads except for the month of June.

From January 1, 1938, to July 1, purchases made by the Class I railroads totalled approximately $313,152,000, consisting of $164,282,000 of materials and supplies, exclusive of fuel, received from manufacturers, and $35,306,000 of new locomotives and cars not otherwise included in material and supplies,—a total of $199,588,000 of materials and equipment from manufacturers. The remaining $113,564,000 was spent for fuel. The totals are exclusive of expenditures for heat, power, light and other services, and also materials and supplies purchased by contractors of railroad construction and represent average expenditures by the railroads of approximately $2,000,000 per working day during the last six months, despite the drastic retrenchment made by all railroads in the effort to keep operating expenses below earnings.

The six months' purchases of materials, fuel and equipment, however, were smaller by approximately $376,939,000, or 55 per cent, than in the first six months of 1937, and were the lowest expenditures for a like period in five years, although they were larger by approximately $109,021,000 or 53 per cent, than in the first six months in 1933 when buying was at its lowest. The total for the last six months was smaller by $743,569,000, or 70 per cent, than in the first six months in 1929, and smaller by $432,119,000, or 58 per cent, than in the first six months of 1930.

Expenditures for materials and supplies, exclusive of fuel and equipment, received from manufacturers during the six months exceeded the corresponding expenditures in 1933 by $50,392,000 but were smaller by $206,901,000,



Monthly Comparison of the Orders Placed for Rail and Equipment, January, 1936, to July, 1938

or 56 per cent, than in the first six months of 1937. They were smaller by $94,358,000 than in the first six months of 1936, and were $272,001,000 or 62 per cent under corresponding purchases in 1930. Equipment ordered in the six months (including orders for freight cars placed by the Southern in May but not yet released on July 1, and also equipment for electrification authorized by the Pennsylvania in June) totalled more than in the same period in 1933 and about equalled the six months' total of 1935, but was $138,014,000 under the corresponding total of 1937; $187,288,000 below the corresponding total in 1936 and $361,815,000 below the corresponding total in 1929.

Materials Purchased from Manufacturers—5 Mos.*

	1933	1937	1938
Alton	$372,619	$1,419,930	$919,881
Alton & Southern	.....	137,432	70,854
Ann Arbor	86,790	292,438	110,579
Atchison, Topeka & Santa Fe	1,424,691	15,008,531	6,238,606
Atlanta, Birmingham & Coast	140,848	361,173	268,284
Bangor & Aroostock	350,384	440,580	600,412
Bingham & Garfield	.....	109,825	60,101
Boston & Maine	1,079,024	2,615,856	1,107,821
Cambria & Indiana	.....	60,010	62,557
Central of Georgia	425,749	1,171,046	696,706
Central of New Jersey	691,123	1,454,631	1,071,459
Central Vermont	204,412	434,936	231,354
Chesapeake & Ohio	3,588,024†	8,812,394†	7,044,009†
Chicago & Eastern Illinois	233,624	1,277,736	634,931
Chicago & Illinois Midland	119,453	1,865,544	177,946
Chicago & North Western	2,677,404	8,926,801	4,015,141
Chicago, Burlington & Quincy	2,347,485	11,141,052	4,135,112
Chicago Great Western	591,299	1,613,013	1,073,802
Chicago, Rock Island & Pac.	1,540,997	6,299,332	5,625,172
Chicago, St. P. M. & O.	512,440	1,430,206	643,023
Clinchfield	.....	468,028	436,370
Colorado & Southern	.....	530,659	279,367
Columbus & Greenville	32,338	96,283	59,485
Delaware & Hudson	1,170,742	1,988,946	559,866
Detroit & Mackinac	.....	62,486	35,540
Detroit & Toledo Shore Line	.....	76,024	66,283
Detroit, Toledo & Ironton	66,604	497,748	204,943
Duluth, Missabe & Northern	122,233	1,122,432	632,341
Duluth, South Shore & Atlantic	63,476	133,249	123,288
Elgin, Joliet & Eastern	187,666	1,395,686	369,064
Florida East Coast	246,270	546,999	416,978
Fort Worth & Denver City	.....	396,287	405,641
Great Northern	1,441,374	5,865,733	3,133,004
Illinois Central	2,529,176	8,620,897	4,459,376
Kansas City Southern	281,041	856,018	427,635
Kansas City Terminal	.....	265,138	206,038
Lake Superior & Ishpeming	10,263	90,382	53,522
Lehigh & New England	81,273	251,098	76,384
Lehigh Valley	.....	2,650,263	1,030,260
Louisiana & Arkansas	88,661	722,929	244,916
Maine Central	286,785	1,000,550	689,176
Minneapolis & St. Louis	.....	.....	468,194
Missouri-Kansas-Texas	570,143	1,738,510	814,770
Missouri Pacific	2,474,304	15,837,266	5,745,156
Mobile & Ohio	237,334	566,487	477,283
Monongahela	.....	199,984	76,567
Montour	.....	108,657	85,577
N. C. & St. L.	655,577	1,265,281	714,665
N. Y., C. & St. L.	1,412,090†	3,924,260†	2,311,762†
N. Y., N. H. & H.	1,854,862	4,748,804	3,237,152
N. Y., O. & W.	.....	292,076	213,593
New York Central	15,274,900	39,538,584	11,510,898
Northern Pacific	.....	4,661,485	3,523,803
Northwestern Pacific	51,227	60,947	78,043
Penna.-Long Island	8,900,284	31,271,128	7,570,697
Penna.-R. S. S. Lines	.....	178,337	95,035
Peoria & Pekin Union	.....	173,850	96,938
Pere Marquette	1,470,607	3,167,151†	2,024,809†
Pittsburg & Shawmut	24,789	89,552	43,730
Pittsburgh & West Virginia	14,390	368,275	137,947
Pittsburg, Shawmut & Northern	38,172	44,538	25,609
Reading	1,020,218	3,160,216	1,158,107
R. F. & P.	296,396	568,711	448,708
St. L.-S. F.	2,056,665	4,689,022	2,620,701
St. L. Southwestern	225,193	2,034,986	752,834
Seaboard Air Line	.....	3,878,907	2,085,725
Southern Pacific	1,900,365	8,598,777	5,101,061
S. P. & S.	.....	297,836	319,987
Tennessee Central	101,424	226,337	108,377
Term. R. R. Ass'n of St. L.	.....	460,023	348,405
Texas & New Orleans	713,226	3,154,445	1,858,136
Texas & Pacific	622,145	2,025,996	1,080,422
Union Pacific	3,365,335	15,205,607	6,375,832
Utah	50,850†	102,444	33,347
Virginian	.....	1,750,498	1,553,599
Wabash	747,748	4,896,838	1,368,055
Western Maryland	412,059	1,674,805	735,553
Western Pacific	424,300	2,780,600	2,295,900
Wheeling & Lake Erie	221,939	1,660,315	193,515

* Includes Ties and Lumber. Excludes Fuel and Equipment.
† Includes fuel.

The combined purchases of materials and equipment, exclusive of fuel, from manufacturers for six months exceeded the corresponding figure in 1933 by $79,841,000 but represented a decline of $344,915,000, or 63 per cent, from the corresponding purchases in 1937 and a decline of $218,646,000, or 52 per cent, from the corresponding purchases in 1936. They were less by $383,166,000, or 66 per cent, than in the first six months of 1930 and smaller by $685,134,000, or 77 per cent, than in the first six months of 1929.

Railway Purchases—First 6 Months of Year

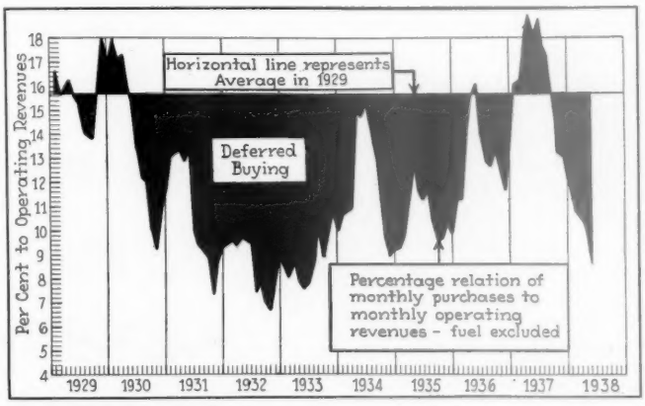
	Materials* received from manufacturers (000)	Equipment ordered from manufacturers (000)	Total from manufacturers (000)	Fuel (000)	Total Including fuel (000)
1929	$487,601	$397,121	$884,722	$171,999	$1,056,721
1930	436,283	146,471	582,754	162,517	745,271
1931	272,859	28,873	301,732	127,141	428,873
1932	150,450	2,623	153,073	94,650	247,723
1933	113,890	5,857	119,747	84,354	204,131
1934	210,686	66,850	277,536	104,694	382,230
1935	180,750	35,696	216,446	124,800	341,246
1936	258,640	222,594	418,234	127,959	609,193
1937	371,183	173,320	544,503	145,588	690,091
1938	164,282	35,306†	199,588	113,564	313,152

* Includes rail and forest products.
† Includes $8,135,000 of Equipment to be built in Pennsylvania Shops.
Revised to July 14, 1938.

Purchases in the six months included approximately $10,591,000 of rail, as compared with $29,326,000 in the first six months of 1937; they included approximately $20,817,000 of cross ties, as compared with $28,460,000 in the first six months of 1937; while $131,874,000 of materials were received for maintaining locomotives, cars and tracks and building equipment in company shops, as compared with $313,397,000 in the first half of 1937.

Hit Bottom in May

With few exceptions, the trend in purchases has been continuously downward month by month from the first quarter of June, 1937, to June of this year. In May, 1938, the purchases of materials and supplies and fuel (partially estimated) totalled $37,647,000, as compared with $53,228,000 in January, 1937, and $84,605,000 in



Monthly Purchases—Material, Exclusive of Fuel and Equipment, Compared to Monthly Operating Revenues, January, 1929, to June, 1938

May, 1937, and they were smaller in May than in any month since December, 1934. Purchases of materials and supplies, other than fuel, rail and cross ties, in May totalled $17,687,000, as compared with $26,008,000 in January, 1938; and with $54,051,000 in May, 1937, and were the lowest since June, 1933. Tie buying in May was lower than in any month since January, 1936.

Railway Purchases—Materials and Supplies

1937	Fuel (000)	Rail (000)	Cross ties (000)	Other Material (000)	Total (000)	Total Less Fuel (000)
January	26,054	3,128	3,923	46,862	79,967	53,913
February	26,328	3,858	3,399	45,415	79,000	52,672
March	30,644	6,224	4,985	55,942	97,795	67,151
April	19,583	5,343	5,107	56,536	86,569	66,986
May	20,516	5,009	5,029	54,051	84,605	64,089
June	22,463	5,764	6,017	54,591	88,835	66,372
6 Mos.	145,588	29,326	28,460	313,397	516,771	371,183
1938						
January	21,879	1,379	3,962	26,008	53,228	31,349
February	20,027	1,948	3,808	21,458	47,241	27,214
March	19,913	2,355	3,991	23,486	49,745	29,832
April	18,283	1,982	3,485	21,235	44,985	26,702
May	14,962	1,927	3,071	17,687	37,647	22,685
June (est'd) ..	17,500	1,000	2,500	22,000	43,000	25,500
6 Mos.	112,564	10,591	20,817	131,874	275,846	163,282

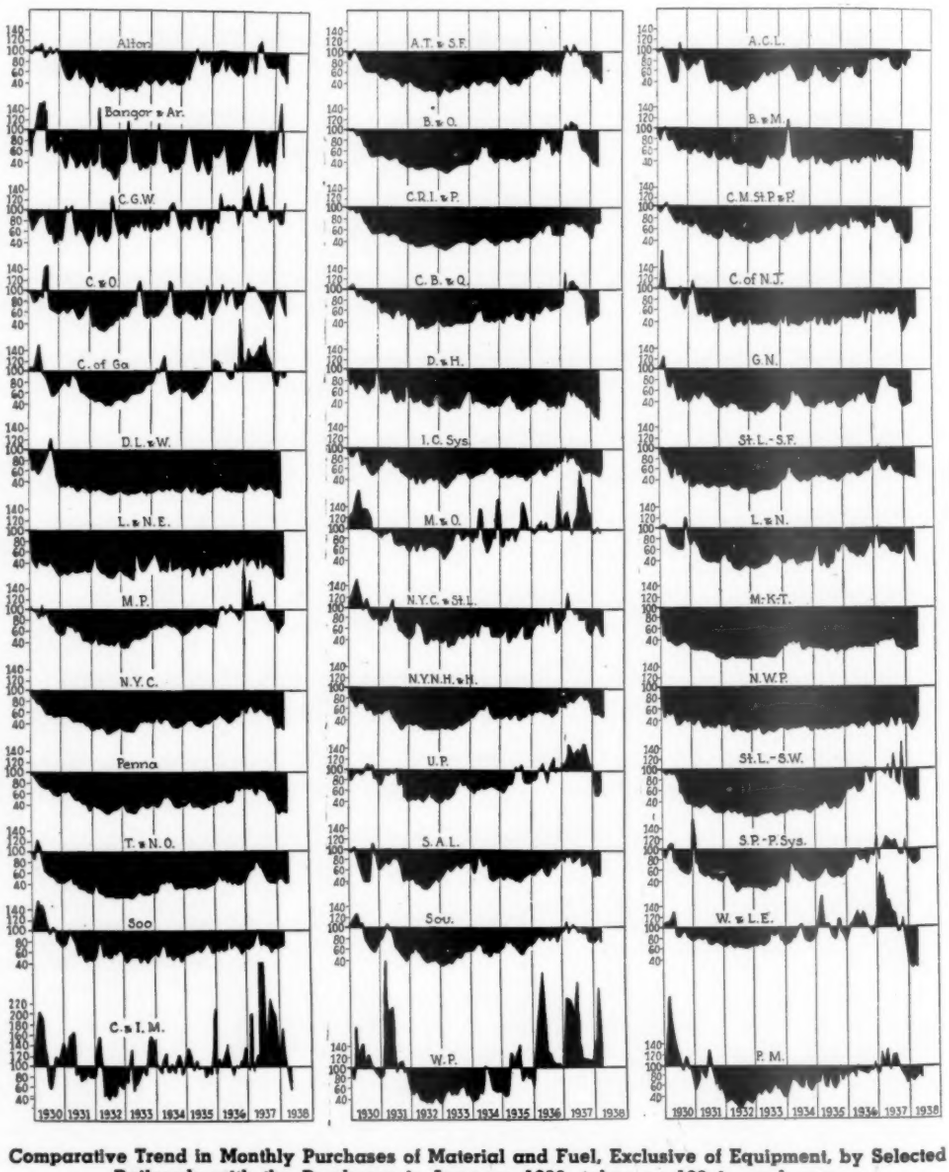
Revised to July 14, 1938.

Deficiency Grows

Prior to 1930 the expenditures by the railroads each month for materials and supplies, exclusive of fuel and equipment, were approximately 15.7 per cent of the operating revenues per month. Subsequently the railroads spent less per dollar of operating revenues each month until January, 1937, when the ratio of purchases to revenues mounted to 16.5 per cent and continued up to 19.0 per cent in April, 1937. From that time on there was a continuous decline in the relation of purchases to operating revenues to May, 1938, when the purchases of materials, exclusive of fuel, were only 8.5 per cent of the May operating revenues. Not since June, 1933, have monthly purchases of material been so small in relation to operating revenues. It would have required approximately $75,000,000 more buying of material in the first five months of this year to have maintained a normal relation between purchases and revenues.

While the trend has been predominately downward, two roads bought more materials and supplies during the first five months of this year than in the corresponding period of 1937 and, of 64 railroads reporting May purchases, 18 bought more in May than in January and 6 had larger purchases in May than in any previous month this year. Railroads reporting larger expenditures in May than in April included the Central of Georgia; the Chicago Great Western; the Illinois Central; the Lehigh & New England; the New York, Ontario & Western; the Pittsburgh & West Virginia; the St. Louis Southwestern; the Southern Pacific; the Spokane, Portland & Seattle; the Texas & Pacific; and the Wheeling & Lake Erie.

It will be several weeks before all the railroads complete their accounts for June. However, the first reports show increases in purchases over May which, when considered with the widespread declines reported for materials in stock, indicate that purchases may have reached their bottom in May and are now in process of expansion. Statistically, purchases were larger in both May and June than in April, when enlarged to include the new equipment ordered by the Southern in May and the new equipment authorized by the Pennsylvania in June, but delays in releasing these orders have in reality made this equipment a part of the business that has yet to materialize for manufacturers.



Comparative Trend in Monthly Purchases of Material and Fuel, Exclusive of Equipment, by Selected Railroads with the Purchases in January, 1930, taken as 100 in each case

Executives Scan Highway Transport in Reports

Railway annual reports discuss road competition and operations of highway affiliates

THE annual reports of the railways for 1937 paid rather extensive attention both to the motor transport operations of the railroads themselves and to highway carriage of freight and passengers as a competitive agent. In several instances the Motor Carrier Act came in for earnest comment, while the inroads of highway operators on railway traffic and revenue gave rise to complaints. Extensions of highway services for both freight and passengers and the use of motor trucks for pick-up and delivery freight service were given detailed attention in many instances. The following excerpts have been selected from the statements to stockholders and from the statistical tables that customarily accompany them.

President E. W. Scheer of the Reading reported that at the end of 1937 the Reading Transportation Company operated more than 620 miles of motor coach routes and 922 miles of truck routes. During the year operations were discontinued over two bus routes and two truck routes, including the Philadelphia, Pa.-Langhorne-New York bus route of 93 route miles, the Trenton (N. J.)-Somerville bus route of 31 miles, the motor truck route between Philadelphia and New York of 107 miles, and the truck line between Allentown, Pa., and New York, of 93 miles. All but the Trenton-Somerville line were operated jointly with the Jersey Central Transportation Company, subsidiary of the Central of New Jersey. According to the statement of investment securities owned, the Reading at the end of the year held a total of $600,000 worth of stock of the Reading Transportation Company. The report also stated that the railroad handled 81,388 tons of L. C. L. freight in motor truck pick-up and delivery service by contract truckers during 1937, which service cost the road $139,061, or $1,708 per ton. In addition, 157,079 tons were delivered or collected locally by shippers or consignees, for which a total tariff allowance was made of $157,079. Total L. C. L. tonnage of the road increased 68,653 over 1936, while revenues therefrom rose $155,187.

As president also of the Central of New Jersey, Mr. Scheer reported that 45,144 tons of L. C. L. freight were handled on that road in pick-up and delivery service by contract truckers at a cost of $82,479, or $1.83 per ton, while 39,876 tons were delivered or collected locally by shippers or consignees, for which a total tariff allowance was made of $39,882. The road owns the entire outstanding stock issue of the Jersey Central Transportation Company, which had a par and book value of $20,000.

New England Lines

President W. F. Cram of the Bangor & Aroostook pointed out that the operations of the Bangor & Aroostook Transportation Company, the highway subsidiary of the road, "were of substantial benefit to the railroad during the year." He further said that highway operations were substituted for unprofitable branch line train service, and that bus connections were made with main line trains to and from various towns that previously had not enjoyed such service. The consolidated income account of that road showed that the affiliates of the railroad, including the Bangor & Aroostook Transportation company, earned together gross revenues of $75,732 during 1937 (the difference between total railway operating revenues and total railway, transmission and bus operating income).

In his report to the stockholders of the New York, New Haven & Hartford, H. S. Palmer, president, said that operation of the New England Transportation Company system for the year 1937 yielded a net deficit of $54,800 (including depreciation charges of $196,131 and $79,110 accrued interest not paid to or included in the income account to the railway company proper), or $28,204 less deficit than for the year 1936. Concerning the Connecticut Railway & Lighting Company, an important Connecticut bus operating subsidiary, the report stated that the railroad is seeking rejection of its lease, which is now in litigation. Separate income accounts which appeared for various highway operating subsidiaries revealed that the Soundview Transportation Company, wholly-owned subsidiary of the New York, Westchester & Boston, itself 99.61 per cent owned by the New Haven, showed a net deficit of $3,819 during 1937, or $5,574 less than the deficit for the previous year. The County Transportation Company, Inc., another wholly-owned bus subsidiary, reported a net income of $11,134 for 1937, a decrease of $3,171 in net as compared with 1936. A separate income account for the New England Transportation Company showed, in addition to the net deficit reported above, that this affiliate had total operating revenues of $2,980,823 during 1937 and total operating expenses, including depreciation and retirements, of $2,662,316. The entire issue of capital stock of the company, having a par and book value of $1,500,000, is held by the New Haven, which also holds notes of the company in the amount of $1,318,500. Concerning pick-up and delivery of L. C. L. freight, Mr. Palmer reported that this service was further extended during 1937 and was in effect at 131 stations on March 24, 1938.

President E. S. French of the Boston & Maine reported that expenses involved in the movement of railroad freight by motor truck between freight stations in substitution for train movement amounted to $371,000 in 1937. In compliance with an order from the Interstate Commerce Commission, these operating expenses, which were formerly charged to operating expenses were accounted for in 1937 as a deduction from freight revenues. Concerning the effect of the federal Motor Carrier Act of 1935 on highway subsidiaries of the carriers, Mr. French stated that the language of the act causes great uncertainty as to the status of such service in connection with railroad operations and added that "it

has become increasingly clear that it will be difficult for railroads to expand their highway operations." In this connection he reminded the stockholders that the Boston & Maine, through its subsidiary, the Boston & Maine Transportation Company, had already established such co-ordinated highway operations in this territory "well in advance of the passage of the Act." Regarding further provisions of the Motor Carrier Act, the Boston & Maine president was of the opinion that regulation of freight-carrying motor trucks, because of the large number of operators, and the chaotic state of the roads and types of service offered "is still in the development stage" and pointed out that "truck rates, though published, have not yet been worked out on a general compensatory basis."

As president also of the Maine Central, Mr. French reported that that road received $37,355 in income from operations of the Maine Central Transportation Company, or $37,891 less than in 1936. During the year the transportation company extended its intrastate operations to include lines between Bangor, Me., and Mattawamkeag, Stockton Springs and Ellsworth. Applications for authority to operate these lines in interstate service are pending before the Interstate Commerce Commission.

The report of the president of the Fonda, Johnstown & Gloversville showed the passenger revenues of its bus lines (including urban and inter-city routes) was $165,337 during 1937, an increase of $79,145 over the previous year. During the year three 21-passenger and two 32-passenger motor buses were purchased; at the close of 1937 the company operated a fleet of 27 buses. Revenue passengers carried by highway during the year totaled 2,467,081, an increase of 1,581,288 over 1936. It was also stated that the application filed for abandonment of the interurban railway lines between Schenectady and Fonda has been upheld by the United States Circuit Court of Appeals, reversing the adverse decision of the lower federal court. The decision gives the trustee authority to apply to the Interstate Commerce Commission and the Public Service Commission of New York for abandonment of the above road and substitution of buses therefor, petitions for which have been filed; motorization of the line will convert an average annual loss of about $53,000 for the last 10 years on the electric division to an average annual profit from buses of at least $30,000. It was further reported that the cost of such motorizing will be paid out of the salvage of the electric railway lines.

The statistical table of securities owned by the Pennsylvania Railroad Company, as of December 31, 1937, revealed that the company held 17,282 shares of common and 1,500 shares of preferred stock of Pennsylvania Truck Lines, Inc., from which preferred stock the road received an income of $7,500 during the year.

Southern Lines

The investment table of the Central of Georgia for 1937 showed that at the end of the year the company owned the entire $5,000 outstanding common stock issue of the Central of Georgia Motor Transport Company. A similar table appearing for the Richmond, Fredericksburg & Potomac showed that that company owned stock of the R. F. & P. Transportation Company having a par and book value of $90,000 and reported holdings in the Richmond-Greyhound Lines, Inc., to the extent of $98,000 par value and $105,000 book value. In addition, advances of $31,500 to the former company and of $156,800 to the latter were noted, as of December 31, 1937.

President I. B. Tigrett of the Gulf, Mobile & Northern reported that the railroad had advanced $85,250 to the Gulf Transport Company, organized in 1936 "with a view to co-ordinating highway and rail transportation." These advances brought total financing of the subsidiary to $95,250, including the purchase of its capital stock. Of the funds thus advanced, about $38,000 has been invested in land, $49,500 in equipment and $5,600 in garages and garage equipment. The securities account of the road showed that the Gulf Transport Company had a total stock issue of $9,700 par value.

The report of the Louisville & Nashville recorded that the Kentucky legislature, during its regular session of 1938, passed legislation authorizing railroad corporations to own and operate trucks and buses and to own stock in companies engaged in motor transportation. In this connection, the report pointed out that prior to the enactment of such legislation, railroad corporations chartered under Kentucky laws were without charter power to engage directly or indirectly in motor transport. This restriction applied to the Louisville & Nashville not only in its operations in Kentucky but in the 12 other states in which it operates as well. The list of securities owned by the Louisville & Nashville revealed that the company owned stock of the Gulf Transit Company having a par value of $8,230 and a book value of $82,300.

The securities report of the Illinois Central showed that the road continued to own the entire 50 shares outstanding stock of the Central Transportation Company of Illinois and all of the 200 shares of the Mississippi Valley Transport Company, at the close of the year. During the year the entire 500 outstanding shares of the Central Transportation Company of Delaware were withdrawn from the securities portfolio of the road.

President Fitzgerald Hall of the Nashville, Chattanooga & St. Louis, devoted a paragraph to the inauguration of pick-up and delivery service for L. C. L. shipments in which he stated that the service "has had the effect of bringing back some business to the rails," but added that "whether the added business is worth the added cost is a close question."

Receivers of the Norfolk Southern stated in the annual report of the road that the Norfolk Southern Bus Corporation, a wholly-owned subsidiary, operated during the year 1,441,676 bus miles and carried 745,928 passengers, with a gross revenue of $326,403 and a net from operations of $25,668, as compared with $24,630 profit the previous year. It was further brought out that the bus corporation operates a common carrier service between Norfolk, Va., and Virginia Beach, between Norfolk and Washington, N. C., and between Williamston, N. C., and Columbia.

Southwestern Lines

President Daniel Upthegrove of the St. Louis Southwestern reported to the stockholders that the Southwestern Transportation Company, a wholly-owned highway subsidiary, operated 92 motor trucks and 43 trailers at the end of 1937. This road owns 1,000 shares of the Southwestern Transportation Company having a book value of $1,481,100.

G. A. Thompson, trustee for the Missouri Pacific, reported that during the year the Missouri Pacific Transportation Company made re-arrangements in route involving a net decrease in route mileage of 123 leaving a total of 4,948 miles at the end of the year. Involved in the discontinuance were routes between Eldon, Mo., and Boonville, a distance of 71 miles, and between Atchison, Kans., and Concordia, a distance of 164 miles. Two coaches were obtained during the year from an

independent company, while 32 coaches were scrapped. Hence at the end of 1937 the company operated 129 coaches, compared with 159 coaches on hand on December 31, 1936. The report added that arrangements have been made to acquire 20 new motor coaches, all of which will be accounted for in 1938. The railroad holds 1,000 shares of the highway subsidiary's stock at $100 par value per share, and had made advances to the company totaling $5,585,577, up to December 31, 1937. Assets of the transport company include $2,877,971 in notes receivable from the Missouri Improvement Company, a wholly-owned subsidiary of the parent railroad. The report of the International-Great Northern on its affiliated companies revealed advances to the Missouri Pacific Transportation Company of $105,000, up to December 31, 1937.

The report of the St. Louis-San Francisco, presented by J. M. Kurn and J. G. Lonsdale, trustees, stated that by authority of the federal court granted on September 17, 1937, the road organized the Frisco Transportation Company "for the purpose of establishing and operating a co-ordinated and auxiliary motor truck service" for the transportation of freight, mail and express by highway between stations on existing rail lines of the company. The highway transport affiliate was incorporated under the laws of Delaware and has an authorized capital of $450,000, of which $100,000 has been subscribed by the trustees. The company had not yet commenced operations on the date of the report, April 25, 1938.

C. E. Johnston, president of the Kansas City Southern, noted in his report to the stockholders that the road organized the Kansas City Southern Transport Company, under the laws of the state of Louisiana in 1937, which company would contract for the collection, transportation and delivery of L. C. L. freight. He noted further that the company owns no equipment or real property and is controlled by the railroad through ownership of its entire capital stock issue, amounting to 50 shares having a total face amount of $5,000.

Canadian Lines and U. S. Subsidiaries

In the Canadian National report, S. J. Hungerford, chairman and president, noted: "One of the pressing problems in the transport situation is the placing of highway and inland water competition on a fair and equitable basis in relation to the railways. The directors are gratified to observe that the Parliament and Legislatures of Canada are giving consideration to this serious problem."

According to the list of investments of the Canadian Pacific, that railroad owned the entire capital stock issue of the Canadian Pacific Transport Company, Ltd., having a par value of $50,000 and held stock in the Pennsylvania-Ontario Transportation Company to the extent of $187,500 par value. According to the investment account of the Duluth, South Shore & Atlantic, controlled company of the Canadian Pacific, the subsidiary road held at the end of the year capital stock in the Mackinac Transportation Company in the amount of $21,667 and had advanced $202,844 to that company.

C. T. Jaffray, president and chairman of the Minneapolis, St. Paul & Sault Ste. Marie, included in his report a somewhat lengthy discussion of bus and truck competition, in which he expressed the hope that the control now exercised over highway transport by the Interstate Commerce Commission "will eventually enable the railroads to regain such traffic as they can handle more efficiently than the trucks." He also pointed out that the motor carriers are co-operating with the railroads to increase rates on competitive traffic to levels, "commensurate with the service performed" and further noted that "substantial progress has been made in stabilizing the rate structure of motor carriers."

Western Carriers

President Sargent of the Chicago & North Western included in his report excerpts of the plan which he prepared and presented to the railroad investigating subcommittee of the Senate Interstate Commerce committee on March 16, 1938. One of the proposals included therein was that the Motor Vehicle act should be so amended as to enable the carriers to engage in highway operations "without the restrictions now imposed under the decision of the Commission in the so-called Barker case."

According to the statistical tables in the Atchison, Topeka & Santa Fe annual report, the road owned at the close of the year 2,600 shares out of a total of 90,000 outstanding of capital stock of the Santa Fe Trail Transportation Company and, in addition, controlled 49,720 shares through its subsidiary, General Improvement Company. Total investment in the Santa Fe Trail Transportation Company charged to capital account was quoted at $1,023,988. In addition, the company owned the entire outstanding capital stock of the Santa Fe Transport Corporation, having a book value of $25,000; the entire capital issue of the Santa Fe Transportation Company of California, having a book value of $11,000; and the entire outstanding stock of the Santa Fe Transportation Company of Delaware to the value of $1,000. Further, it was noted that a total of $319,860 had been advanced to the Santa Fe Transportation Company of California; $16,500 to the Santa Fe Transportation Company of Delaware; and $1,216,788 to the Santa Fe Trail Transportation Company, up to December 31, 1937.

The report of the Union Pacific revealed that the Interstate Transit Lines, 70.9 per cent owned by the railroad, which operates highway motor coaches in Union Pacific and Chicago & North Western territory between Chicago and Los Angeles, Cal., and the Union Pacific Stages, a wholly-owned subsidiary operating between Salt Lake City, Utah, and Portland, Ore., together received delivery of 45 37-passenger streamlined motor coaches during the year and ordered 50 additional coaches of the same type. Interstate Transit Lines and controlled companies earned a net income of $907,083 during the year and had a surplus at the close of the year of $326,480. Union Pacific Stages, a wholly-owned subsidiary, and its controlled company, earned a net income of $355,051 during the year and had a surplus, as of December 31, of $7,782.

According to the list of affiliated companies of the road, it held directly, as of December 31, 1937, 186,965 out of a total of 263,829 outstanding shares of capital stock of Interstate Transit Lines; the entire 30 outstanding shares of Union Pacific Stage Company, and the entire 6,500 outstanding shares of Union Pacific Stages, Inc. During 1937 it received dividends of $323,449 from Interstate Transit Lines, which it credited to its income account, a decrease of $31,784 from dividends received during 1936.

According to the income account of the Denver & Rio Grande Western, dividend earnings from motor operations totaled $21,262 in 1937, as compared with $19,900 in the previous year and $7,140 in 1935. The 1937 dividend figure is the largest since commencement of dividend payments from this source in 1927. The list of pledged securities of the road outstanding on December 31 includes $56,700 par value stocks of the

Denver Colorado Springs Pueblo Motor Way, and $135,200 par value stock of the Rio Grande Motor Way. Unpledged investments in affiliated companies include $300 in stock of the Rio Grande Transport Company.

The investment account of the Great Northern showed that the road owned common stock of the Northland Greyhound Lines, Inc., having a book value of $1,286,171.

The list of investments in affiliated companies by the Northern Pacific showed that the road owned stock in the Northern Pacific Transport Company to the extent of $1,000 book value, which was 100 per cent of the total outstanding. As of December 31, the road had advanced $331,500 to the transport company and had received $14,096 in dividends or interest on its investment. The securities account of the Northwestern Improvement Company, a wholly-owned subsidiary of the road, showed possession of $131,049 in joint notes of the Yellowstone Park Transportation Company.

President Ralph Budd of the Chicago, Burlington & Quincy reported that the Burlington Transportation Company, wholly-owned affiliate of the road, suffered a net operating loss in its bus operations of $280,139 for the year, as compared with a net loss for 1936 of $204,749, and earned a net profit of $9,570 on its truck operations. Mileage statistics for the company during the year record 10,500,000 bus miles over a total of 6,442 route miles and approximately 2,500,000 truck miles over a total of 1,797 route miles.

The Burlington Transportation Company acquired on January 1, 1938, Bell Transfer, Inc., operating between Kansas City, Mo., and Minneapolis, Minn., and between Kansas City and Chicago, and took over on December 27, 1937, properties of the Redman Truck Lines and the Burlington Motor Freight Lines, which companies held valuable intrastate permits covering routes in southern Iowa over which the Burlington Transportation Company bus division held interstate rights. Hence, by this acquisition the railroad affiliate was able to merge its interstate operations with the newly-acquired intrastate operations, "thus securing a compact and economical arrangement." During the year a modern truck terminal was erected at Galesburg, Ill., at a cost of $59,000, and 13 units of equipment were acquired and placed in service.

Co-ordination on the Coast

The annual report of the Southern Pacific listed in detail the widespread investments of the company in both directly-owned and affiliated motor transport organizations. Wholly-owned motor companies operated 83 buses over 442 miles of route in Los Angeles, Cal., and vicinity as of the close of the year. Wholly-owned trucking and transport companies, operating both highway truck and urban drayage service, performing storedoor pick-up and delivery at various points along Southern Pacific railroad lines and affording co-ordination of highway truck service with rail services, operated 207 motor trucks, 138 trailers, 64 tractors and 3 buses over 6,910 miles of highway truck routes and 77 miles of bus routes; performed drayage in 59 cities and furnished pick-up and delivery service at 871 important rail stations. In addition to these highway companies proper, wholly-owned electric railway properties in California operated 167 buses over 230 route-miles and used an additional 74 buses in the joint operation of 140 miles of bus route. According to Chairman Hale Holden's statement to the stockholders, "Service by these companies is being further extended as conditions warrant."

Several of these wholly-owned motor transport companies, which perform pick-up and delivery services for the road and motor truck service by highway, were afforded separate income accounts in the report. They comprised the Pacific Motor Transport Company, the Pacific Motor Trucking Company and the Peoples Freight Line, Inc., (acquired by Pacific Motor Trucking at the close of 1937) operating in Oregon, California, Nevada and Arizona, the Southern Pacific Transport Company, operating in Texas; and the Southern Pacific Transport Company of Louisiana. Together these companies had gross revenues for 1937 of $6,125,989, which was a $530,270- or 9.5-per cent increase over 1936. These companies paid during the year a total of $4,306,429 on contract agreements to rail carriers, nearly all of which went to the Southern Pacific and its separately-operated affiliates. The Pacific Motor Trucking Company alone enjoyed operating revenues of $1,063,371, an increase of $90,519, or 9.3 per cent, over 1936. Motor Transit Company, which operated 441 miles of motor bus routes, took in $745,672 in revenues.

Discussing further storedoor pick-up and delivery operations, the report stated that there was little change during the year in the extent of such service on the system. It was pointed out, however, that improvements in service were effected by changes in operations which expedited the delivery of merchandise to consignees. Furthermore, the Southern Pacific continued to expand highway trucking operations during the year, in line with its policy of providing co-ordinated train and trucking operations for the purpose of increased revenues and economy. It was noted that on December 31, 1937, by authority of the I. C. C., the Pacific Motor Trucking Company acquired full control, through stock ownership, of the Peoples Freight Line, Inc., which latter company operates trucking routes extending over 700 miles of highways in southern Arizona and 55 miles in California and performs storedoor pick-up and delivery service for railroad freight at a number of points along its routes. Application has been made to the commission for authority to merge its operations with those of the Pacific Motor Trucking Company proper. At the end of the year over-the-highway freight service of the railroad's affiliated trucking and transport companies, provided with owned equipment and under contracts with independent motor truck operators, extended over 6,909 miles of highways in Oregon, California, Nevada, Arizona, Texas, and Louisiana.

The report also discussed operations of motor bus companies affiliated with the Southern Pacific. In this connection it was pointed out that the railroad, at the end of the year, possessed 35.87 per cent stock ownership in Pacific Greyhound Lines, which owns 462 motor buses, operating over 9,280 miles of routes extending from Portland, Oregon, south, through San Francisco, Cal., Los Angeles and San Diego to El Paso, Texas and from San Francisco, east, to Salt Lake City, Utah, and from Los Angeles, east, to Albuquerque, N. M. The company, at the end of the year, had a 5.65 per cent interest in the Southwestern Greyhound Lines, and an additional 9.62 per cent interest through the St. Louis Southwestern, 87.37 per cent of whose outstanding capital stock is owned by the Southern Pacific Company. Southwestern Greyhound, at the end of the year, operated 174 motor buses over 6,082 miles of route in the territory east of Denver, Colo., and Albuquerque, N. M., extending to Kansas City, Mo., and St. Louis and south to Lake Charles, La. The report went on to say that while both of these services are operated independently "in certain instances, co-ordination of the motor bus schedules with the steam train service of the rail lines has been effected to the benefit of both, and further co-ordination is being developed when and where conditions warrant."

Members of the General and Advisory Committees of the Purchases and Stores Division, A. A. R., at the Annual Meeting in Chicago, July 13

From left to right: J. C. Kirk, general storekeeper, C. R. I. & P.; C. H. Murrin, general storekeeper, L. & N.; L. P. Krampf, supply agent, M. P. Lines; G. M. Betterton, purchasing agent, S. P.-Pac. Sys.; C. C. Warne, purchasing agent, N. Y. C.; Julius Yzewyn, assistant to secretary; E. W. Walther, general storekeeper, B. & O.; A. L. Sorenson (Chairman), stores manager, Erie; W. J. Farrell, secretary; O. A. Donagan, general storekeeper, B. & M.; G. A. Goerner, general storekeeper, C. B. & Q.; U. K. Hall, general storekeeper, U. P. Sys.; J. L. Bennett, purchasing agent, C. of Ga., and E. J. Lamneck, purchasing agent, Penna.

Purchases and Stores Division Reviews Year's Work

Price extras scrutinized—More standards for material and reclamation—New cures for surplus—Revise stores manual

ALTHOUGH the recession in railway business dissuaded the Purchases and Stores Division, A. A. R., from holding a convention this year, members of the general and advisory committees, the latter composed of past-chairmen of the Division, met in Chicago on July 13, to review the work of the association and especially to receive the reports of committees. The reports of 17 committees were considered, including those on price extras, forecasting requirements, scrap handling and reclamation, stores expense, stock control, terminal railway storekeeping, transportation of company material, supplies for buses and trucks, stationery and printing, fuel and office methods and these reports were released for publication subject with the proviso that they will be submitted to letter ballot vote of the membership and presented for final approval at the next annual convention. Another contest among railway employees for papers on purchasing and store department activities was held and preparations were begun for the complete revision of the Division's manual of recommended practices.

A statement by Chairman A. L. Sorensen, manager of stores, Erie, and reports of various committees are presented in part as follows:

Statement By Chairman Sorensen

The Purchases and Stores Division, A. A. R. has contributed and continues to contribute to economy in railroad operation by having made available for more productive purposes about $400,000,000 previously invested in materials and supplies, also by substantial reductions made in the operating costs of the department, by reductions made in scrap handling costs, and by the increased revenues obtained from scrap as a result of improvements in the preparation of scrap for market and in reclamation. The economical acquisition, handling, accounting for and disbursing of all materials and scrap requires constant study and is receiving that study by the Division.

The activities of the Division were carried on during the past year with only such meetings as was felt would produce the very best results. In view of depressed economic conditions it was decided to postpone the annual meeting a year. However, the completed reports of the majority of the committees were presented and acted upon at the meeting of the General Committee at Chicago, July 13, with final approval subject to letter ballot vote and action at the next annual meeting. It was also decided that the present officers and committee personnel would continue until the next annual meeting.

Group Meetings Continued

The purchasing and stores group meetings were continued throughout the year. Subjects considered at many of these meetings were actively discussed and the results have been helpful to the committees.

During the year, the Special Purchasing committee was engaged in the study of locomotive fuel prices. This subject became important as a result of the Bituminous Coal Act of 1937, also known as the Guffey Act, which provided for minimum prices on various grades

and sizes of coal. The first schedule became effective December 1, 1937, which would have increased the cost of fuel coal to railroads about $20,000,000 per year. On February 25, 1938, the Commission revoked the established prices, rules and regulations. The work of this committee constituted one of the major activities of the Division during the year and will be continued during the current year.

The Purchasing Statistics committee was active during the year, in conjunction with the vice-president of operations and maintenance of the Association, the Bureau of Railway Economics and the public relations branch of the Association, and arrangements were made with designated railroads to furnish the Bureau of Railway Economics the prices of specific items of materials each six months so that such data will at all times be reasonably current.

During the year the Sub-Committee on Classification of Water Service Materials submitted a report to this Division for review and recommendations, which the division has made.

Annual Contest Winners

The Annual Best Paper Contest was again held during the past year. Many satisfactory papers were presented and it was decided that the two best papers were submitted by James O. Brophy, chief clerk, stores department, Canadian National, Port Mann, B. C.; and J. Clark Windbigler, company agent, stores department, M-K-T., Parsons, Kan. It is the intention to invite the authors of these two papers, together with the winners of next year's contest, to the next annual meeting.

During the year a committee was appointed to work with the research committees of the Mechanical and Engineering divisions. The committee has proposed several items for consideration, which are being investigated by the research committees of the respective divisions.

A joint committee consisting of representatives of the Mechanical Division Price committee and representatives of this Division are revising methods for arriving at prices for materials for equipment used in interchange which we believe will greatly improve performance.

Stores Manual

The Division is completing an entire revision of the Purchasing and Stores Department Manual which will be issued in the near future. This manual covers all recommended rules and practices for the department and its various operations, and will establish ready reference and standardization. The manual will be issued in loose-leaf form so that changes may be issued on sheets of the same size and inserted in the original record.

A comprehensive report was submitted by the Committee on Forecasting Material Requirements, with recommendations based on the experiences of many railroads following the rapid recession in business last fall. A report was submitted this year for the first time on the subject Quantity Price Differentials and contains a complete list of price differentials by classes of materials. The Committee on Scrap Handling, Preparation and Selling included in its report an important statement listing all accidents at scrap plants during 1937.

As a result of the consideration which has been given to methods of transporting company material on line and the prompt unloading of equipment, the General Committee authorized the appointment of a committee to work jointly with the Transportation Division for the purpose of developing further reduction of non-revenue ton-miles. Also as a result of a recommendation of the Committee on Material Handling Expense and Facilities, it is expected that an encyclopedia of material-handling equipment will be prepared and maintained in secretary's office.

While the Committee on Stock Record Systems did not make a complete report this year, definite recommendations based on economies and advantages will be submitted during the coming year. The Committee on Extension of Purchasing in Standard Packages is making substantial progress with the manufacturers. The Committee on Annual Accounting Inventory has not completed its work but arrangements have been made for further relations with the accounting representatives of the committee, that will produce substantial improvements and economies.

Report on Handling Scrap

Reports were received from 67 railroads, of which 38 are using the A. A. R. classification in its entirety while 29 roads are using classifications of their own. Many of the 29 roads have classifications strikingly similar to former A. A. R. standards, indicating that their classifications have not been brought down to date. These classifications were compared with the A. A. R. standard in an appendix.

The committee held that the A. A. R. scrap classification is broad enough to cover all railroad needs for all markets and that if the classification is used, the railroads will obtain the maximum returns for scrap sold and urgently recommended that railroads not now using the standard classification, should arrange for its early adoption and use.

The committee also recommended changing the A. A. R. scrap classification, to require that Rail, Steel No. 1, should be suitable for rerolling into bars and shapes.

Classification Numbers

It was recommended in 1935 and approved by the Division that A. A. R. classification numbers be universally adopted and used, and that in cases where railroads found it necessary to include additional classes, the numbers should be assigned by the secretary of the Division. Since that time requests have been made for numbers for 10 special classes of ferrous scrap and 10 non-ferrous, but no requests were received during the current year. Some are evidently under the impression that special numbers should be requested to cover every miscellaneous sale. This was not the intent of the recommendation. Special numbers should only be requested where the same item is sold month after month.

The committee reviewed the terms of sale, revised as of 1932, and recommended no changes.

Scrap Arbitration

In 1931 the Division approved the establishment of a scrap arbitration committee, to be composed of members of the scrap handling committee. The thought embodied in the recommendation was not to "arbitrate" claims, or their settlement, between roads and buyers, but only to clarify the technicalities of the classification which lead to differences between buyer and seller. By an active application of this procedure technicalities resulting in claim losses can be corrected. One case was submitted to the arbitration committee during this year and this was reviewed in the report.

The committee kept in touch with the activities of the standing committee of the U. S. Department of Commerce, Division of Simplified Practice, on the grading and classification of iron and steel scrap but had no changes to recommend in the A. A. R. standard classification.

Cost Records

The committee emphasized the importance of maintaining accurate and active records of costs and operating figures at scrap

plants. Considering the small margins existing between profit and loss in scrap handling and dismantling operations, close observation of cost and operating figures is essential not only to create profits but to prevent losses. To be most effective, the records should be maintained at the scrap plant where they are available at all times for reference.

The report included a table describing 48 accidents, mostly minor, which occurred at scrap plants, with their causes and the preventive measures taken.

Labor-saving devices described in the report included a double end press to break scrap triple valves, angle and cutout cocks, and straighten track spikes; an improvised shear to break scrap triple valves; a shear to straighten track spikes; a press for breaking scrap triple valves showing plunger with floating knife blade, die plate for holding valve, and a sheet iron safety guard which swings on a hinge and protects the operator from flying pieces; a machine equipped with a knife tool and die plates for holding angle and cutout cocks; a press for straightening track spikes; a set-up of an alligator shear battery designed to reduce handling to a minimum; an alligator shear mounted on concrete base elevated to permit gravity flow of sheared scrap to a bucket placed on the ground; a shop-made hydraulic device for stripping angle cocks and gage cocks; a shop-made device for stripping triple valves; a portable shop-made air-operated hose baling press; a device for removing lead from locomotive driving wheel centers.

The committee consisted of W. J. Sidey (chairman), supervisor scrap and reclamation, L. V.; E. J. Becker, assistant general storekeeper, S. P.; D. D. Canavan, general foreman reclamation plant, B. & M.; J. J. Collins, supervisor scrap and reclamation, Erie; J. T. Goodloe, division storekeeper, Southern; R. R. Kane, division storekeeper, L. & N.; C. L. McIlvane, assistant purchasing agent, Penna.; C. E. Reasoner, assistant district storekeeper, M-K-T; T. H. Ryan, assistant purchasing agent, Wabash; J. A. Sims, purchasing department, C. & N. W.; H. E. Warren, manager purchases and stores, G. M. & N.; and J. C. Kirk (chairman ex-officio), general storekeeper, C. R. I. & P.

Report on Store Expense and Inventory

Based upon information obtained by members of the committee while attending purchases and stores group meetings, study has been given to making the stock report more acceptable to members who have been unable to contribute statistical information for it.

A reduction in the number of material classes has been suggested. Consideration has also been given to changes which would separate the semi-annual report into regions. However, the committee is still of the opinion that the report in its present form, which breaks the stock down into 12 basic classes, is economical, simple to prepare and permits ready comparisons on a mileage, regional or operating basis. The report can be progressively improved by closer co-operation of all carriers in contributing the necessary information.

Material Stock Report

For the benefit of roads not maintaining the classified balance sheet in its entirety, the committee proposes a change in the form of the stock report which will permit separating commissary, ties, rail, fuel and scrap, and allow all other items to be reported, where necessary, in one amount in the line reading: "Total Items 1 to 7." The form will then read as follows:

1—Frogs, Switches and Rail Fittings, Class 1-A and B.
2—B&S Lumber, Iron Bridges, Turntables and Structural Steel, Classes 4 and 6.
3—Signal, Interlocking, Telegraph and Telephone Material, Class 2.
4—All Other Maintenance of Way Material, Classes 1C—3—7—9.
5—Maintenance of Equipment Material, Classes 11—12—13—14—15—17—18—19—20—21—22—23—24—25—26—27—28—29—30—31—32—33—35.
6—Material in Process of Manufacture, Class 34 (See note B).
7—Miscellaneous Material Common to All Departments, Classes 36—37—38—42—45—46—47—48—49.
Total Items 1 to 7.
8—Dining Car, Restaurant, Commissary Supplies, Class 41.
9—Ties, Cross and Switch, Class 5.
10-A—New Rail, Class 8.
10-B—Relay Rail (Other than Scrap).
11—Fuel, Classes 39 and 40.
12—Scrap.
Grand Total.

In arriving at the per cent of issue or the day's stock on hand, only charges to closed accounts and sales should be recognized as proper consumption figures in order to avoid duplication by the inclusion of materials transferred from one class to another.

Store Expense

The committee proposes, in place of the 1937 recommendation, that the secretary procure from each railroad the 1937 figures as to total payrolls and charges to store expense, as follows:

Column 1—Total purchasing and store department payroll (including reclaim, scrap handling or other special operations under stores supervision).
Column 2—Purchasing and store department payroll charged to store expense.
Column 3—Labor from other departments, including proportion of purchasing expense charged to store expense, and accounting expense for work performed by the accounting department.
Column 4—All other charges to store expense, including supplies, fuel, power, switching, etc.
Column 5—Total charges to store expense.

These data will be maintained as confidential information in the secretary's office.

New Committee

The committee recommended that the Accounting Division representatives be again requested to act with the committee during the ensuing year and that a special committee be appointed by the chairman to review this subject with the accounting representatives. The chairman appointed a committee consisting of C. H. Murrin (chairman), general storekeeper, L. & N.; O. A. Donagan, general storekeeper, B. & M.; and E. W. Walther, general storekeeper, B. & O.

The report was prepared by M. E. Baile (chairman), assistant supply agent, M. P.; W. E. Brady, stores accountant, A. T. & S. F.; J. P. Hogan, chief accountant, Erie; F. J. McMahon, general storekeeper, N. Y. C.; D. H. Reed, traveling storekeeper, Southern; J. F. Riddle, analyst, stores department, Penna.; W. L. Wheeler, assistant general storekeeper, C. & N. W.; and O. A. Donagan (chairman ex-officio), general storekeeper, B. & M.

Report on General Reclamation

The Joint Committee on Reclamation was organized in 1934, for the purpose of obtaining coordinated effort on reclamation. The members of the committee are to originate and invite suggestions for reclamation, and the using departments to establish the methods, tolerances, etc., and include them in Mechanical and Engineering division practice manuals. This method of handling was approved by the vice-president, operations and maintenance department, A. A. R., and the various interested sections of the Association.

During the year the Mechanical Division was requested to prescribe reclamation practices and tolerances as follows:

Helical Springs: Tapered end broken. Maximum dimensions allowable for broken end. Minimum free height before necessary to reset and retemper. Method of resetting, retempering and test.

Journal Boxes: Wear tolerance on top of box. Recommended gage for checking top wear. Wear tolerance for wheel hub wear. Tolerance on journal box bolt holes. Recommended method of reclamation.

Brake Levers: Minimum thickness. Minimum width. Wear limit on brake pin holes and recommended method of restoring hole to size.

Brake Connections: Minimum diameter of bar. Minimum width and thickness of jaw. Wear limit on brake pin holes.

Brake Connection Pins: Minimum diameter.

Coupler Yokes, Wrot Iron: Wear limit on thickness of bar and tolerance on rivet holes.

Coupler Yokes, Cast Steel: Thickness tolerance on side wall of yoke before welding is necessary. Tolerance on keyway before welding.

The Engineering Division was requested to prescribe reclamation practices and tolerances for track tools which, when com-

pleted, will be included in its Manual and incorporated in the report of this committee.

New Practices

The committee received descriptions of new reclamation practices in effect on some roads, which have been listed as information. Steel rubble cars are manufactured from second-hand car channels welded together. The wheels and roller bearings are reclaimed from second-hand motor car wheels. The floor is made of wood, 1¾ in. thick, laid on the bottom leg of the channels and held by 1½ in. by 1½ in. channels bolted to the frame.

Spring plates are made from scrap car sides. The scrap car sides are sheared to size, heated and formed under a punch press adapted for this work.

Bushing worn pin holes in brake beam struts is performed by reaming the worn pin hole to 1½ in. diam. A hardened steel bushing 1⅛ in. inside diam. and 1½ in. outside diam. (plus .008 in. for press fit) by ¾ in. is pressed in each side of the strut.

Metallic steam hose is reclaimed by building worn parts by welding and then machining to gage. A vice is used for dismantling and assembling, a master gage for gaging after machining the built-up part of the coupling, a vice and V blocks for holding the coupling and Y casting for machining, a jig and reamer for reaming A, D, L and B castings for installing hardened bushings, a reamer for reaming the ends of L and B castings after welding on brass rings to build up to original size, a grinder and wheel to grind out rust and pits in coupling, and a jig for machining the ends of Y castings to remove rust and rust pits.

Journal boxes with a taper wear of 3/16 in. from wheel wear are built up with fumeless bronze and ground to original surface dimensions.

Wiping rags are washed in a standard 36 in. by 30 in. washing machine in a special solution for removing oil and grease. After washing they are placed in an extractor where the water is removed and are then placed in a dryer for drying.

The purchases and stores representatives on the joint committee were A. L. Prentice (chairman), manager scrap and reclamation, N. Y. C.; I. C. Bon, superintendent scrap and reclamation, Wabash; E. R. Casey, superintendent reclamation, U. P.; R. E. Hamilton, supervisor reclamation, C. & O.; T. J. Hegeman, superintendent scrap and reclamation, C. B. & Q.; W. P. Stewart, supervisor scrap and reclamation, I. C.; Peter Young, general superintendent reclamation plant, A. T. & S. F.

Report on Forest Products

A tentative revision of specifications for temporary grain doors was included in the 1936 report and approved at the annual meeting. These specifications were submitted to the General Managers' Association of Chicago for approval, which association returned the file with the report that the association could not pass on the revision. The specifications have since been referred to the Operating-Transportation Division.

Cross Tie Specifications

It was recommended in 1937 that the revisions proposed in A. R. E. A. and A. A. R. Cross Tie Specifications be referred to the Engineering Division. That division reported as follows: "The 1936 and 1937 reports of the Committee on Forest Products, Purchases and Stores Division, refer to the failure of railroads to adopt the standards of the Engineering Division for cross ties. Specifications were collected in 1935 and 1936 by Division VI, and compilations were submitted to Division IV as evidence of the fact that not many railroads had printed the 1934 specifications, that many more still used the 1926 specifications and that some continued to use the 1917 specifications of the U. S. Railroad Administration. A compilation of specifications obtained late in 1937 by the Committee on Ties, A. R. E. A., shows that some roads adopted the present A. R. E. A. standard for cross ties since they were reported as non-conforming by Division VI and that the latter considered the slightest departure from the text of the standard specification as a non-conformance.

"The specifications sponsored by the Committee on Ties are recommended practice in attainable standards. If they merely represented what the majority of railroads practiced, no progress would be made. That they are not too advanced for practical application is evidenced by the millions of ties which are annually obtained under inspection governed by them.

"The Committee on Ties is aware that there exists, as in the past when other specifications were standard, a certain amount of contention for greater tolerance in dimensions than is stipulated. It is equally well aware that no matter what dimensions may be standard, some railroads, under the stress of competition in procurement, will accept undersize ties, and that sub-standard dimensions will be stressed as proving that no greater size is required. It is also fully aware that the higher speeds and heavier loads which more and more prevail require larger and better cross ties than were satisfactory in the past. Consideration of all conceivable suggestions for downward changes in the current specifications for cross ties resulted in the conclusion that the present standard should not be revised."

It is now recommended that all railroads adopt or adhere, as closely as it is practically possible, to the A. A. R. specifications.

Loading at Mills

At the meeting of the Far Western stores group it was suggested that this committee endeavor to develop the possibility of restricting the number of sizes that may be loaded in a car, it being desirable to have as few sizes as possible, preferably one, and to use strips so that a cable can be inserted to permit handling by crane. The committee concluded that this is a matter that should be handled direct with the mill by the buyer.

The committee, in its 1937 report, stated that the subject of grades of fir car lumber would be referred to the purchasing agents of the West Coast railroads for careful study to determine what particular grades are being used by the Western railroads, and to reduce the number of grades. The information was referred to the purchasing agents of the West Coast roads and they voted unanimously against reducing the number of grades now shown for car lumber in the West Coast Lumbermen's Association Grading Rules No. 10.

The committee consisted of A. J. Neault (chairman), assistant general purchasing agent, C. & N. W.; D. R. Elmore, assistant to general manager, Fruit Growers Express; F. W. Holt, assistant purchasing agent, Erie; L. W. Kistler, superintendent treating plants, St. L.-S. F.; J. R. McGrenera, general tie and timber inspector, A. T. & S. F.; J. E. McNelley, chief tie and lumber supervisor, A. C. L.; E. H. Polk, assistant purchasing agent, S. P.; G. H. Robison, purchasing agent, U. P.; F. A. Schack, fuel and timber agent, G. N.; F. C. Sheehan, assistant purchasing agent, N. Y. N. H. & H.; W. A. Summerhays, manager, Forest Products Bureau, I. C.; James Young, assistant purchasing agent, Penna.; C. C. Warne, (chairman ex-officio), purchasing agent, N. Y. C.

Report on Highway Vehicles

By purchasing and using standard automotive equipment it is possible to get along with a very small stock. If special machines are purchased not only will their cost be higher, but local dealers cannot be depended upon to carry stocks of special parts. Few railroads should require as much as $10,000 of parts for highway motor vehicles for some time to come, unless there is a very much larger use of motor vehicles by railroads than at present.

Crank Case Oil

One large railroad with a fleet of trucks in maintenance operations is not yet reclaiming crank case oil because the units are widely scattered. Where the highway units are serviced at central garages operated by highway subsidiaries, the crank case oil is mixed with the oils of the subsidiaries, reclaimed, and re-issued. On one railroad the reclamation of crank case oil from Diesel locomotives is assembled in drums and sent to the point where the railroad journal waste and oil lubrication is reclaimed by contract. The cost of new crank case oil used for the Diesel locomotives is 44 cents per gal. The used crank case oil is reclaimed under contract at 10.5 cents per gal. Where

new motors are added to a fleet and older units scrapped or otherwise retired, the amount of oil released and reclaimed decreases materially.

A table shows the results of reclaiming crank case oil on four highway subsidiaries of a railroad.

Oil Reclaimed During 1937 by Four Subsidiary Companies of a Railroad

Type of Machine	20 Gal. Type A	50 Gal. Type A	100 Gal. Type B	20 Gal. Type A
Installed	1930	1931	1935	1930
Gal. per Yr. Reclaimed	1,450	11,000	4,627	600
Per Cent Recovery	75	84	90	87½
Cost of Reclaimed Oil, Cents per Gal.	13	11	11.8	20

Retreading Tires

One railroad, with a subsidiary which operates 200 motor trucks and tractors, and 100 semi-trailers, retreaded 272 truck tires in 1926, and 255 in 1937. A comparison of the costs of new tires, mileage received and cost per mile, and the cost of retreading, the mileage received, and cost per mile of retreaded tires, together with total cost, are shown in a statement.

The railroad began retreading tires used on trucks in maintenance operations, assembling them for retreading by contract. During the year 1936 there were 51 tires retreaded, and during the following year, 150 tires were retreaded. As the fleet increases and as tires on trucks recently purchased wear out, retreading will be extended, the work to be done by local tire shops at points where it will be convenient to assemble the tires. No worn casing should be scrapped until it has been passed on for retreading.

Cost Per Mile of New and Retreaded Tires

	Cost of New Tire	New Tires Mileage	Cost Per Mile, Cents
36 x 6—10 ply	$40.92	27,893	0.001467
900 x 22—10 ply	66.16	46,214	0.00143
975 x 22—12 ply	86.96	57,846	0.0015
1050 x 22—12 ply	101.88	54,337	0.001873

RETREADED TIRES

	Cost of Retread	Mileage	Cost Per Mile, Cents
36 x 6—10 ply	$11.21	25,011	0.000448
900 x 22—10 ply	18.26	26,777	0.000677
975 x 22—12 ply	20.81	42,782	0.000486
1050 x 22—12 ply	22.01	16,252	0.001354

NEW AND RETREADED TIRES

	Total Cost	Total Mileage	Total Cost Per Mile, Cents
36 x 6—10 ply	$52.13	52,904	0.000985
900 x 22—10 ply	84.42	72,991	0.001156
975 x 22—12 ply	107.77	100,628	0.00107
1050 x 22—12 ply	123.89	70,589	0.001755

The committee consisted of James Deery (chairman), assistant purchasing agent, Penna.; E. S. Jamieson, assistant general purchasing agent, U. P.; J. H. Lauderdale, general purchasing agent, M. P.; R. D. Long, purchasing agent, C. B. & Q.; C. E. Smith (chairman ex-officio), vice-president, N. Y. N. H. & H.

Report on Shop-Made Material

The same consideration shall be given to every item of material manufactured in railroad shops that is given to material purchased from an outside manufacturer or jobber. Quantities should be controlled to meet the requirements of the railroad at the time the store order is issued. A stock book record on the items to be manufactured should be maintained in each instance and store orders made only from such records. The records shall indicate surplus material at other locations on the railroad as well as the quantity at the point of manufacture.

Material to be manufactured in the shops should be carefully studied on each railroad, and facilities for manufacturing and distributing material at the place of manufacture should be given thorough consideration to determine if it is economical and practical to manufacture the item rather than to purchase it. Manufacture of material on each railroad should be concentrated preferably at one shop point, or at least at shops which are properly equipped to perform the work. Centralization of manufacture affords the opportunity of quantity production to obtain the lowest possible price.

Proper accounting methods should be employed to permit accurate comparisons with prices obtained by the purchasing department from outside manufacturers to insure that material is not being manufactured which could be purchased at a lower cost. Where material is manufactured in railroad shop used exclusively for manufacturing material, the indirect expenses should include repairs to buildings; repairs to tracks; repairs to machinery and equipment; depreciation on buildings, tracks, machinery and equipment; insurance on buildings and contents, and loss through injury to persons or damage to property; interest on investment in buildings, tracks and equipment; taxes; injuries to employees; pensions; stationery and printing; and superintendence.

Where material is manufactured in railroad shops erected and used principally for repairs to equipment, it is impossible to determine a percentage which should be generally added to the charges made directly to the store order for labor and material used with shop and store expense included. Therefore, each railroad should make its own study at each plant and determine what percentage should be added to the charge-out price.

The committee consisted of B. T. Adams (chairman), district storekeeper, I. C.; R. W. Hall, division storekeeper, L. & N.; A. N. Laret, assistant to chief purchasing officer, St. L.-S. F.; W. L. Oswalt, works storekeeper, Penna.; C. J. Vanderbosch, district storekeeper, B. & O.; L. P. Krampf (chairman ex-officio), supply agent, M. P.

Report on Fuel

A sub-committee was appointed to work under the direction of the special purchasing committee of the Division on prices for railroad locomotive fuel in connection with the Bituminous Coal Act of 1937, also known as the Guffey Act, which set out to establish minimum prices for the various grades and sizes of coal. The first schedule which became effective December 16, 1937, would have increased locomotive fuel costs to the railroads about $20,000,000 per year. On December 13, 1937, the Association of American Railroads filed a petition with the Commission seeking postponement of locomotive fuel prices pending a hearing. This petition was denied by the Commission on December 15, after a preliminary hearing, and further hearings were set before a board of trial examiners, which was not authorized to grant the postponement of locomotive fuel prices pending public hearings.

On January 28, 1938, a petition was filed in the United States Court of Appeals for the District of Columbia by various members of the Association of American Railroads and the American Short Line Railroad Association, for a stay of prices pending further hearing. This petition was granted February 11, 1938, restraining the Commission from enforcing or taking any steps to enforce locomotive fuel prices. In the meantime hearings were being held by the Commission on petitions of consumers' counsel, and a number of consumers were petitioning and receiving from the courts the same relief granted the railroads until finally, on February 25, the Commission revoked the established prices and rules and regulations, making all established minimum prices ineffective.

The committee included in its report the average cost per ton of locomotive coal and the tons of coal consumed by the railroads in 1937 as compiled by the I. C. C.

The committee consisted of P. A. Hollar (chairman), fuel purchasing agent, Penna.; E. S. Bonnet, fuel purchasing agent, N. Y. C.; E. A. Busk, assistant to general purchasing agent, C. & N. W.; Robert Collett, fuel agent, St. L.-S. F.; A. E. Johnson, fuel agent, C. M. St. P. & P.; G. E. Lyman, special assistant to vice-president, I. C.; M. H. McGlynn, fuel agent, C. R. I. & P.; J. E. May, fuel agent, B. & O.; and C. E. Smith (chairman ex-officio), vice-president, N. Y. N. H. & H.

Report on Forecasting Requirements

During the early part of 1937, the railroads were confronted with constantly mounting prices for practically all commodities. To avoid paying increased prices they placed orders and contracted for materials and supplies sufficient for many months. At the time these forecasts were prepared, business generally was steadily increasing and an optimistic spirit was prevalent throughout the country. No one could reasonably be expected

to foresee the sudden and rapid decline in business that took place during the latter part of 1937. The decreased consumption that followed what otherwise might have been a wise forecasting of requirements, saving thousands of dollars in purchase bills, resulted in substantial increases in material and supply balances and a reduction in the savings anticipated when the forecasts were made. Unnecessary monies were "frozen" in the material balances for materials that were not needed or had to be carried an undue length of time—money that was badly needed for other and more pressing liabilities.

What have we learned from this experience that will be helpful in forecasting requirements under similar circumstances in the future? It has been stated that it costs approximately 16 per cent annually on each dollar invested in material to cover carrying charges, such as interest, depreciation, taxes, insurance, handling, etc. This carrying charge is, of course, one of the first considerations in arriving at the number of months we can profitably afford to order ahead but other matters should be given consideration.

The committee realizes that the responsibility for determining the policy to be pursued in buying ahead is largely managerial and financial, and that no hard and fast rule can be laid down, nor can one be determined on any scientific basis, but any purchases beyond a three-months period, even though justified from the standpoint of carrying charges, should be closely analyzed in the light of the other factors. With items of material not so subject to disturbance in consumption, purchases beyond three-months' requirements may be made profitably and safely but on items for back shops and car programs, A. F. E.'s, and maintenance-of-way work, which are usually curtailed when recessions in business occur, any purchases beyond three months should be made only after the most mature consideration of the purchasing and stores departments and those responsible for the financial investment necessary. The carrying charge is one of the principal factors to be considered in determining to what extent purchases can be made profitably to obtain discounts for quantity.

Material for Programs

In ordering material for programs work, where the total quantities required can be definitely determined ahead, and where buying ahead to avoid paying extras is not a factor to be considered, and where the quantity that will be used each month can be fairly well determined, some roads order the total quantity needed for the job, specifying the monthly deliveries to meet the anticipated output. The recent recession of business and the subsequent curtailments in expenses that were necessary, justify the recommendation that so far as practicable, only 30 days' requirements should be ordered at one time so that any curtailment in work will result in carrying over only a minimum quantity of material.

Changes in Designs

If losses from obsolescence, unnecessary carrying charges, etc., are to be avoided, the supply department should be advised and consulted by the using departments as far in advance of the effective date as is possible, of all changes in designs, practices, programs, etc. Lack of such information may result in ordering material which may ultimately have to be scrapped or carried an undue length of time.

When changes in designs, patterns, etc., are made and it is economical to use the supply already on hand, instructions should be issued by the management to the using departments so that the displaced material will be used first before starting to use the new. If the supply on hand is not to be used for its original or some other purpose, the instructions should so state, so that the supply department may make the most economical disposition.

Shop Made Material

It is just as important not to over-order shop-made materials as not to over-order on purchase materials. However, the cost of machine set-up must be carefully considered in determining the quantities to be covered by stock orders. Where the cost of machine set-ups is not a material factor, stock orders should be based on 30 days requirements. Where the cost of the machine set-up justifies, the quantity ordered may be increased, but in general not to exceed a 90 days' supply.

Dismantling Programs

As far as practicable, consideration should be given to tearing down those classes of equipment which will provide the most material for current repair programs and maintenance work, either in original form or as a substitute. Where there are a relatively large number of cars on the dismantling list, purchase bills can be materially reduced by selecting first those cars for dismantling which will provide the material most currently needed.

The committee consisted of C. K. Reasor (chairman), assistant manager of stores, Erie; C. D. Baldwin, purchasing agent, Bang. & Aroos.; B. W. Griffith, general storekeeper, N. Y. C.; and A. B. Lackey, division storekeeper, Southern.

Report on Purchasing Records

The Requisition-Order was suggested at the 1927 meeting of this division. A questionnaire was submitted to the railroads for the purpose of ascertaining the number using this method, and replies were made by 95 roads, operating 237,351 miles of road. The 39 roads which have adopted the method include railroads of all sizes, operating 121,194 miles of road. The 56 roads answering that they are not using this method could not see any advantage to be gained so far as their roads were concerned.

In connection with this method, the committee received a description of a Requisition-Bid-Order method, involving the use of spirit duplicating equipment, eliminating to a large extent rewriting both bids and orders. In view of this further development, the committee thought it desirable to withhold any definite recommendations until it had an opportunity to give this extension of the Requisition-Order method further study.

Release Order System

The release order system is taking care of almost half of the standard stock items on one railroad. The method eliminates the preparation of purchase orders and other work in the purchasing department, thereby obtaining to a great degree the same efficiency afforded by the Requisition-Order method. The release order system is used in ordering monthly requirements of materials which will be procured from a specified source at a prearranged price. Items ordered include brake shoes; steel, malleable and brass castings, mechanical devices and repair parts; air brake materials; draft gears and parts; gage glasses; engine sand; battery elements; booster parts; frogs, switches and parts; motor car repair materials; hose; stoker parts; packing; boiler lagging; paints of certain kinds; fusees; torpedoes; car seals; mop heads, and carbide lamps and parts.

The system is used for practically all contract items and all others where the source of supply is confined to one concern.

On January 1 of each year a formal purchase order is placed by the purchasing agent with each participating concern. This order covers requirements (quantity not specified) of specific items for the calendar year and is subject to releases authorized from time to time by the general storekeeper. All pertinent information is shown on the purchasing agent's order. Thereafter the general storekeeper has authority to send direct to the vendor release orders for such quantities of specific items as he may require. Release orders are prepared at four of the principal stores and each release order bears the same basic number as the formal requirement order previously placed by the purchasing agent, and, in addition, the storekeeper includes an identifying sheet number.

Release orders are prepared from stock books, the books having been previously stamped with the name of the firm supplying the material. When all data have been compiled in the stock book and the quantity determined, the book is turned over to a typist who writes the release order by starting at the beginning of each material class and listing all items to be ordered from one company in that particular class, repeating the procedure for each class and company.

When the release order has been completed and checked it is

then approved by the storekeeper and passed to the general storekeeper for approval and mailing direct to the vendor. At the time of mailing to the vendor the general storekeeper also approves and forwards to the purchasing agent the purchasing agent's office copy, which serves as a purchase requisition. These requisitions are in the possession of the purchasing agent sooner or at least as soon as the original requisition is received by the vendor, enabling the purchasing agent, before shipments are made, to check the requisition and make changes if he sees fit.

This system has been in successful use on the railroad for several years and extends to about 41 per cent of standard stock items. Under normal conditions it permits carrying stock close to a 30-day basis, the vendor having the release orders within a day or two after mailing, giving him ample time to make forwardings that invariably reach the storehouse within a month. This dependable flow of materials within regular time periods permits minimum ordering without fear of shortage or surplus.

New Devices

Devices brought to the attention of the committee included a sorting device for sorting orders, invoices and other matter of similar nature, in connection with the preparation of purchasing statistics; and an improved duplicating device which does not require gelatine rolls and has proved quite advantageous where now in use by eliminating extensive copying work, especially in connection with requisition-orders.

Some consideration was given to the development of an accurate and true measure of purchasing performance. Such study as was given indicated that it would require considerable time to work out a proper formula or basis. The objective will be to convert statistics into comparable units of work and equate units of work into man-hours. There will be certain constant operations regardless of business conditions. Statistics should be those now available or easily kept, such as requisitions received, orders placed, inquiries issued, etc. The unit should be one of effort times the time, rather than one of time only, or money. The basis for the work done by a man will be that of an average man. Various kinds of work, such as requisition marking, checking bills, etc., should be considered separately and their relation to the whole developed. A distinction should be made between mechanical operations, such as bill sorting and those involving study, initiative, or detailed analysis, such as development of sources of supply. There may be some kinds of work, done in the same way in all purchasing offices, from which a basic unit can be worked out and to which should be added the extras for work peculiar to the office trying to develop its own equation.

The committee consisted of J. H. James (chairman), purchasing agent, P. & L. E.; C. S. Douglass, assistant to purchasing agent, N. & W.; F. E. Driscoll, purchasing agent, Erie; J. S. Fair, Jr., office manager, purchasing department, Penna.; A. B. Kast, assistant to general purchasing agent, L. & N.; H. P. Millar, chief clerk to general purchasing agent, C. P.; M. C. Nystrom, assistant purchasing agent, S. P.; C. R. Painter, purchasing agent, N. Y. N. H. & H.; H. M. Rainie, purchasing agent, B. & M.; A. A. Taylor, assistant general purchasing agent, M. P.; and E. G. Walker (chairman ex-officio), assistant general purchasing agent, A. T. & S. F.

Report on Material Handling

It was recommended that an encyclopedia of material handling equipment be established and maintained in the secretary's office.

The delivery of material by supply cars or supply trains to on-line users of material is the most economical method of delivering material and picking up scrap and second-hand materials. It is safer to handle frogs and other heavy materials by supply train crane than to have this work done by section gangs. This method of delivery can be worked into other train movements and work train service can be eliminated. With the modern supply train crane, rail from small rail laying jobs, such as curve renewals, can be picked up with minimum handling.

There is a large saving in cost of gasoline obtained in tank cars and delivered by supply train over drum shipments or tank truck delivery service. One railroad mixes oil with gasoline on delivery to sections, which has resulted in reduced cost of repairs to motor cars.

With supply car or supply train service, scrap is picked up at regular intervals, made available for sale and converted into cash. The service should be not so infrequent that carelessness develops, particularly in scrap accumulations.

The economy in supply train operation on many railroads has been proven. On the other hand, costs of waybilling, packing, tagging, shipping, unloading by trainmen, handling from freight house to sections, picking up scrap by hand, stopping trains, switching and setting out cars is a burden on the payrolls. These costs are generally concealed. Without supply trains, there is no control over material issues, no exact exchange of material, more opportunity for waste, theft and misuse of material and no opportunity for checking material or cancelling items by checks on the ground. Supply cars can be handled in locals, drags, work against preponderance of business, handle empties and get value received from deadhead crews.

One railroad uses special skids for handling track tools, such as picks, lining bars, tamping picks and other items. On delivery of repaired tools to sections, tools received in exchange are placed on empty skids on supply cars. At headquarters, the skids are spotted in the blacksmith shop by lift truck and when repaired the material is moved back to the supply cars on skids. One skid load of 350 picks means one handling as against 175 or 350 by hand methods.

Store delivery service is recommended practice. Economies are just as great in this service as they are in supply car or supply train delivery Use of three-wheeled motorcycles is recommended for delivery service at large shops where the volume of work justifies. At points where work will not justify motorcycle units, three-wheeled bicycles should be considered.

Engine Supplies

Supplying and maintaining yard boxes in train and classification yards should be under the custody of the stores department. Some railroads carry the value of materials and supplies originally placed in yard boxes in the material and supplies account. The replenishments are charged to appropriate operating expense accounts. A list of the material, showing the quantity and description, is posted in each train yard box. Turnover is checked at least twice a year by a stores representative. Yard box stocks are maintained with the same degree of efficiency as material in store houses.

Supplying of cabooses by the stores department results in economies in both payroll and material. Where the caboose track is at a distance from the store, sub-stores, similar to yard boxes, are placed near the caboose track. A standard list should be maintained against which supplies in cabooses may be checked. Stationery is maintained in a portable stationery cabinet and checked and supplied by caboose supplyman. Where material is missing, the caboose supplyman sends a memorandum to the office and a report is made to the trainmaster. Handling in this manner will improve accounting for the material as well as avoid unnecessary correspondence and friction. At many points the supplies for locomotives can be handled in the same manner as supplies for cabooses.

Attention is directed to the economies available in obtaining fire brick, brake shoes, journal bearings and other items on pallets or skids; also to have manufacturers strip sheet steel and bundle bar iron and steel; pile lumber such as decking and sheathing with two-inch strips to permit unloading by cable. Mills generally do this willingly at no extra cost.

Skip plates are cheaply made and can be handled anywhere with a tractor. This is particularly true at car dismantling yards where the roads are generally poor. Skids can be placed on the skip plates at the dismantling yard, which will permit sorting of second-hand material on skids. The skip can then be hauled to a point where a lift truck can distribute the skids. In handling drums of oil from oil storage to car shops, one man with a barrel truck can move a drum from storage to a skip plate where previously two men were required to load it on trailers. When delivered to the point of use, it is only necessary to roll the drum from the skip plate.

The use of steel strapping in bracing carload shipments of drums of reclaimed journal box packing or skid shipments of

brake beams and other items has resulted in less damage to material from rough handling.

Roadways

Two types of roads are best for general purposes. Roadways of concrete to carry loads of from 8 to 10 tons cost approximately $2.50 per yd. The cost of grading, not included in this figure, is approximately $0.30 per yd. Black top pavement can be obtained ready-mixed which is superior to that mixed on the ground. Black top 3 in. thick costs approximately $1 per yd. Then material must be placed on top of a good foundation of gravel or cinder, well packed.

The committee consisted of A. S. McKelligon (chairman), general storekeeper, S. P.; J. M. Lowe, storekeeper, N. & W.; J. V. Miller, assistant general storekeeper, C. M. St. P. & P.; H. E. Ray, general storekeeper, A. T. & S. F.; W. F. Redman, traveling storekeeper, C. & N. W.; H. M. Smith, general storekeeper, N. P.; S. P. Warmack, general storekeeper, I-G. N.; G. M. Betterton (chairman ex-officio), purchasing agent, S. P.

Report on Stationery and Printing

The committee canvassed the principal railroads to ascertain the progress made in the adoption of the recommended change in specifications for printing interline waybills. A majority of the replies indicated the adoption of the change in weight of paper, and also the elimination of the printing on the back of the waybill, which is no longer required by accounting rules. It was also reported that little difficulty was experienced in obtaining paper which meets the requirements as to breaking strength. While a minimum of 75 per cent sulphite is called for in the specifications of waybill paper, it has been found that some mills have furnished a sheet to printers to conform to the specification requiring a 20 point breaking strength by the use of a sulphate pulp or by the use of both sulphate and sulphite pulp, which will simplify the securing of the paper by the member roads.

Quality of Paper

The committee, in 1937, recommended more extensive use of paper known as 11 lb. "low" sulphite, because of its strength and economy, where 14 and 16 lb. white sulphite bonds have been used previously, and also recommended, that it be purchased under specifications. Paper with less breaking strength than that required for waybills can be used satisfactorily for a majority of railroad forms, and the committee therefor recommended that the specification be changed to authorize a breaking strength of not less than 16 lb. per sq. in.

The size of paper for letterheads and forms has been considered many times. The committee previously recommended 7½ in. by 9½ in. paper for letterheads, second sheets, carbon paper, and other forms. The saving amounts to 23 per cent on paper stock, and a similar saving on carbon paper, where 7½ in. by 9½ in. size is used instead of 8½ in. by 11 in.

Special Forms

The committee has studied continuous fanfold forms and similar special forms, and found that the price per 1000 sheets is considerably higher than for flat forms. Further study is recommended, before additional continuous form installations are made, to make certain that the savings justify the additional costs, and to determine whether the spread in cost is justified in view of the higher price for printing.

Many grades and weights of mimeograph paper are being used at the present time. The committee felt that a 16 lb. sheet is sufficient for the majority of purposes where mimeograph paper is required, except where I. C. C. or other rules require a larger size.

Tariffs

The securing of prices and the awarding of contracts for the printing of tariffs should be handled by the purchasing department. Tariffs produced by planograph have proved acceptable and savings of 25 per cent to 35 per cent can be made. Many railroads have also made additional savings by the use of duplicating machines in the preparation of cancellation notices, division sheets, as well as some of the smaller tariffs.

Forms in quantities of from 5,000 to 50,000 are recommended for combination printing, and savings run from 10 per cent to 40 per cent. While there are a number of combination printers who specialize in group printing and can quote low prices, the forms should be grouped for combination printing when inquiring for prices, to secure the most effective results. With the more general adoption of the committee's recommendations all printers will have greater opportunities to print forms in combinations.

Envelopes

Some member roads are still using Manila paper for envelopes, especially in the smaller sizes. The committee again recommends 16 Sub. Kraft in place of 20 Sub. Manila. The Kraft stock is stronger, will not deteriorate, and the cost is less. Window envelopes have proven to be a time saver and are recommended for mailing vouchers, purchase orders, inquiries, etc. It has been found that the open window style serves equally as well as the glassene window envelopes and costs less. Repeater envelopes effect substantial savings when this type of envelope is properly distributed and used.

Stationery is charged to operating expenses when shipped from the storehouse. As no value is set up in the accounts as to the amount of stock on hand in any individual office, on-line stationery should be carefully supervised. Stocks should be centralized as much as possible and placed in charge of a competent employee and disbursed as actually required. Some railroads maintain a book record at the storehouse to make a comparative check of quantities on requisitions to prevent excessive ordering. Other railroads use a local stock book in preparing requisitions.

Efficient distribution depends largely upon the preparation of requisitions by individual officers. Requisitions should be submitted for actual requirements for a given period only after consideration of average or seasonal consumption, amount on hand and amount due. Also, items on requisitions should be written in alphabetical and numerical sequence. Large offices with limited storage space and those which require considerable quantities should operate on a 30 to 60-day period. Small offices should be permitted to carry a 90-days' supply, or more in some cases. Requisitions should be presented on scheduled dates most suitable to each railroad. When railroads purchase items to be held by the vendor and shipped as required, the larger amounts can be shipped direct to the consuming offices and thus avoid handling costs at the storehouse.

Printers and supply houses should be required to wrap and label stationery uniformly as prescribed by each railroad. In the case of forms, printers should be instructed to pad expensive forms in units of 25 sheets for monthly reports, and 50 sheets for weekly reports, and others of larger consumption in 100 sheets. Packages should have sufficient covering to protect them while in transit. Cartons and wooden packing cases in which stationery is received at the storehouse should be utilized wherever possible. When this is not sufficient, new corrugated paper cartons and gummed tape provide an economical method for shipping.

The committee consisted of B. B. Melgaard (chairman), assistant to purchasing agent, C. M. St. P. & P.; H. Carter, general stationery storekeeper, N. Y. C.; W. J. Duff, stationer, A. T. & S. F.; J. L. Gorsuch, stationer, W. Md.; W. W. Griswold, stationer, C. R. I. & P.; T. J. Kane, stationery storekeeper, C. N. R.; E. H. Nicodemus, stationery storekeeper, Penna.; G. E. Perrot, stationery supervisor, S. A. L.; and J. L. Bennett (chairman ex-officio), purchasing agent, C. of Ga.

Report on Standardization of Stock

A questionnaire was sent to 44 railroads, requesting information for use in studying commodities and 41 railroads, representing approximately 73 per cent of A. A. R. Class I mileage, replied.

A total of 288 sizes of square neck carriage bolts were re-

ported as being used at present. The standard list issued in 1926 has been revised to include 104 sizes, an increase of 22 above the previous list.

A total of 781 sizes of square head machine bolts were reported as being used, up to and including 26 in. in length. The standard list issued in 1926 has been revised to include 300 sizes, an increase of 83 over the previous list. Many bolts longer than 26 in. are used but they are not classed as machine bolts.

A total of 474 sizes of buttonhead steel rivets were reported. The list issued in 1926 as Structural Grade Rivets has been revised to include 117 sizes, an increase of 39 over the previous list. The title has been changed to Buttonhead Steel Rivets, since some railroads use them for both structural and boiler work.

A total of 441 sizes of cone-head steel rivets were reported. The list issued in 1926 as Locomotive Boiler Rivets has been revised to include 116 sizes, an increase of 59 over the previous list. The title has been changed to read Cone Head Steel Rivets. The revised list includes rivets smaller than those used in locomotive boiler work.

Attention is called to the price extras on rivets. Much of this is avoidable by adhering to common standards and to reasonable steps in sizes. Some of the individual extras are small and some are large with the possibility of several extras pyramiding on the same purchase.

The railroads reported 141 sizes of water tight or leak-proof bolts. A standard list has been prepared including 42 of the sizes.

Rivet Specifications

Information, including copies of specifications, has been obtained from 40 railroads, showing the specifications used in the purchase of this material. Ten railroads use the same specification for both boiler and structural grade rivets. Three railroads use the same specification for both boiler and structural grade, except that the chemical and physical requirements are different. Six railroads use buttonheads for boiler work. One railroad uses special high buttonheads for boiler work. Thirty-three railroads use cone heads for boiler work. The basic proportions of rivet head dimensions to the diameter of rivet shank for buttonhead and cone head rivets are the same in commercial practice, A. A. R. Specification and American Standards Association Specification B-18.4, but there are some differences in tolerance. One railroad specifies a special buttonhead for structural work and another railroad specifies a special high buttonhead for boiler work. Otherwise there seems to be a general uniformity in rivet head proportions.

Pipe Fittings—Pressures Specified: Reports from 37 railroads were as follows:

Number of Roads	Pressures Carried
4	Standard pressure and extra heavy
1	Standard pressure, 200 lb. and 300 lb.
3	Standard pressure, 250 lb. and 300 lb.
25	Standard pressure, and 300 lb.
1	200 lb., 300 lb., and 400 lb.
1	300 lb. for all black fittings
1	300 lb. for all purposes except in ⅛ in. size, which are standard pressure
1	300 lb. for all purposes

It is the general practice to carry only two pressures. Reports indicate that standard pressure (125 lb. to 150 lb.) fittings are satisfactory for most general purposes and it is economical to use 300 lb. fittings for pressures over 150 lb. up to 300 lb. because of their greater strength and durability. This reduces the stock of fittings. In the case of valves and unions, the parts for A. A. R. 300 lb. pressure fittings are interchangeable with different makes, which greatly facilitates the making of repairs and the stocking of parts.

Simplification

There are many items of material for which it is not practical to set up simplified lists for all railroads, but which can be simplified by individual roads to advantage. The committee has received several reports of such simplification.

One railroad reports that a survey of twist drills in use at all shops reduced the number to 69 drills of all kinds in diameters larger than ½ in. This was a 50 per cent reduction in sizes and a 30 per cent saving in smaller drills.

Another road reported that a committee established by the vice-president and general manager obtained results as follows:

	Reduction
Paint and varnish brushes	73 to 47
Soap, soap powder, cleaners, etc.	34 to 22
Cans, tinware, measures, etc.	33 to 28
Wire, scrub and sanitary brushes	15 to 7

The sub-committee studying brushes visited several manufacturer's plants to acquaint themselves with processes and problems of manufacture. Standard lists on that road are prepared under authority of the vice-president and general manager and no deviations from these standards are permitted without supplementary order. In addition the stores department, dealing direct with using departments, obtained results as follows:

	Reduction
Brooms	6 to 2
Lumber, bridge and building	215 to 83
Wrenches, pipe	31 to 6

Another railroad reported simplification work on tube expanders. A survey was made and all types and sizes of roller and sectional expanders at all points were tabulated. This showed 17 types in use, with a number of sizes for each type.

A tabulation of all makes, types and sizes carried at the various shops were submitted to the Mechanical Division for simplification. Three types of expanders with the sizes carried in each type were discontinued without eliminating desirable makes or restricting competitive purposes.

Results on another railroad were as follows:

	Reductions
Steel figures and letters	7 to 5
Scoops	6 to 2
Oxygen and acetylene hose	2 to 1
Pipe fittings	1,090 to 500
Stop cocks, including pet, waste drain, cutout and three way	39 to 16
Hacksaw blades	8 to 2
Passenger door holders	17 to 9
Passenger car locks	76 to 43
Driving box cellars	31 to 19
Pedestal wedge bolts	24 to 4
High temperature cements	Confined purchases to one type for lining and another with crushed firebrick for patch work
Grade stakes	Great variety to 4
Padlocks	8 to 3

On another railroad punches and dies were studied with the following results.

	Reductions
Dies	140 to 45
Punches	188 to 39
Total	328 to 84

The committee has under consideration mechanical steel tubing; specifications for steel shapes, plates (except boiler and firebox plates) and bars; self tapping screws, and reamers.

The committee consisted of A. G. Follette (chairman), general material supervisor, Penna.; J. H. Geary, classification inspector, Erie; W. M. Hinkey, supervisor of materials, B. & O.; J. L. Irish, assistant general storekeeper, U. P.; J. U. King, general storekeeper, A. C. L.; F. J. McGuinness, superintendent of stores, D. & H.; W. W. Williams, chief of requisition bureau, N. Y. C.; H. H. Wittekind, inspector of stores, S. P.; and C. B. Tobey (chairman ex-officio), general storekeeper, L. V.

Report on Transporting Materials

Under normal conditions 9.2 per cent of the ton-miles of all freight traffic of Class 1 railways is non-revenue, and 9.9 per cent of all tonnage of freight loaded for transportation by Class 1 railways is non-revenue. The commodities of large volume making up this total are fuel, cross ties, switch ties and other forest products, scrap, ballast, wheels, rail—new and second-hand. The immense volume in which these commodities are handled focuses attention upon the prompt release of equipment in which such materials are loaded. It is the equipment in which miscellaneous commodities are loaded, however, that needs special attention.

A questionnaire was sent to 19 roads to learn of practices which

have been tried and found of value. Since special equipment must be in operation a substantial part of the time to justify the investment, and long periods have recently been experienced where such equipment cannot be operated even on a half-time basis, the committee was reluctant to recommend special equipment except where the overhead costs can be fully justified in periods of depression.

Line Cars Versus Freight Houses

The use of "line cars" from storehouse to line of road prevents the passing of company material through freight houses. One road during 1937 handled in such "line cars" 8,781 tons of material which, if handled through local freight houses, would have cost the company an additional $6,585 on a piece-work basis of 75 cents per ton. In most cases such "line cars" may be revenue cars temporarily assigned or older type of cars unfit for high grade commercial service. On one road as much as 80 per cent of this material is moved between stores in non-revenue cars.

Motor trucks are used, particularly in congested areas, to keep company material out of freight houses. The delay to standard equipment in attempting to pass company material into and out of freight houses is enormous, and can be largely avoided in those areas by the use of the motor truck. The saving in work paid freight handlers is a factor in offsetting trucking costs.

The use of trailers, skids and pallets which can be hauled into the car at shipping points and out of the car at destination without disturbing the lading, is practicable where a quantity of small units of material must be moved to a central point for repairs, and the trailers, skids or pallets with contents are moved directly to the machines. Skids and pallets, of course, can be used economically only where lift trucks are available both at shipping and unloading points.

Special slings are in successful use on many roads for loading one tier of mounted wheels per car and racks for stacking such wheels in two or three tiers per car. Gondola cars divided into three compartments by bulkheads, are used for handling scrap between road points and scrap concentration points. Box cars equipped with channels to eliminate labor in blocking, are used for handling cylinders containing oxygen and acetylene and for handling prepared journal box packing.

The scheduling of line cars should be policed to prevent the movement of cars simply to observe the schedule. Schedules for line cars must be changed with the volume of business. Many varieties of forms are in use for reporting cars under load to facilitate their release. These forms are only as valuable as the user makes them.

Lift Trucks and Skids

Mechanical handling devices for reducing the time of loading and unloading cars include power lift and crane trucks for use in box cars and the locomotive crane for loading and unloading open top cars. Gantry and traveling cranes are efficient within their limitations of movement. Tractors, trailers and skids have their specific advantages, but the conditions under which they can be used economically are also limited. Therefore, the investment in those facilities should be made only after exhaustive study to find the most suitable devices for the particular location under review.

The opinions regarding the merits of some practices are diametrically opposite. One road has practically discontinued supply and line cars, using, instead, cars loaded at freight houses for distribution, thus avoiding empty car mileage. Another road reports a definite saving by the use of line cars. These facts illustrate the need for local study in each case to be certain that the suggested methods will fit the situation economically. One road may be able to use line cars to advantage by loading them in both directions, whereas on another road line cars might create unwarranted empty mileage.

The committee consisted of R. C. Harris (chairman), general storekeeper, Penna.; E. A. Carlson, general storekeeper, P. M.; Clyde Cocke, purchasing agent, N. & W.; F. P. Dugan, division storekeeper, I. C.; A. M. Lemay, inspector of stores, C. M. St. P. & P.; and, G. A. Goerner(chairman ex-officio), general storekeeper, C. B. & Q.

Report on Terminal Storekeeping

Previous committees having outlined recommendations that would improve stores operations on terminal railways, the committee requested information from 15 representative terminal stores to indicate what progress has been made.

As a result of surveys made by the committee in 1929 and 1932, a reduction in the investment in materials and supplies was recommended. The 1929 report indicated that 25 terminal companies had 164 days' supply of materials on hand near the end of the year 1928. The 1932 report included a statement showing 20 terminal companies with an average of 111 days' supply as of October 31, 1931, based on the average issues for the first 10 months of that year. On October 31, 1937, this was reduced to 91 days' supply on hand. Figures for the years 1934 and 1937, were compiled in a table.

Reports from 15 terminal companies indicate that the supply officers on 10 roads report to the president or vice-president, and those on 5 report to the general manager, general superintendent or superintendent.

Control

Present information indicates that 10 terminal railways use stock books, 4 use stock cards, and 1 uses no stock record. The A. A. R. Standard Material Classification is used by 9 terminals, while 6 do not follow it. Fourteen terminal railways make regular stock checks. One makes no stock check except of the more expensive items, the stock being maintained by a progressive record. Of the 14 properties making regular stock checks, 9 use a monthly basis, 1 every 60 days, 1 semi-annually, and 3 an annual basis.

The disposition of surplus is handled in different ways. Some purchase material from proprietary lines and some do not. Some of the terminal companies do not have proprietary lines. In general, the terminals with truck line connections dispose of their surplus by selling it to the truck lines; otherwise by sale to other railroads or to dealers, or by scrapping.

Material Standards

Proprietary lines should keep terminal companies advised of all changes in standards of equipment that will affect materials on hand at the terminal stores. Three terminal companies receive no such notices. Two terminal companies have no definite plan. Two obtain information by having the proprietary road correct the orders for material that they furnish. Three reported that the chief mechanical officers of proprietary lines transmit the information to the mechanical department of the terminal company. Two terminal companies obtain such information from the purchasing agent, or general storekeeper of the truck line. One obtains information from personal instructions given at the time of inspections. Two report that no proprietary line equipment is handled.

It was previously recommended that an annual inspection of terminal stores should be made by purchasing and stores officers of proprietary lines. Present information indicates that on three terminal properties no such inspections are made. Three have inspections at regular intervals, while on nine properties inspections are made, but at no regular interval.

The committee consisted of J. K. McCann (chairman), inspector of stores, C. B. & Q.; R. H. Bruckert, storekeeper, K. & I. T.; A. F. Campbell, general storekeeper, I. T.; F. A. Murphy, district storekeeper, B. & O.; H. A. Smith, purchasing agent, T. R. R. of St. L.; C. W. Yeamans, purchasing and supply agent, C. & W. I.; L. P. Krampf (chairman ex-officio), supply agent, M. P.

Report on Receiving Records

Material receiving records should give a complete record of all material received and one that can be filed so as to be readily accessible for future reference, as prescribed by the Interstate Commerce Commission in regulations governing the destruction of records.

The records and forms used by the railroads studied by the committee vary, but the principle of checking material receipts

is quite similar. A bulk record of material received by cars, baggage, express or truck, is usually made on a tally sheet, with copies to those interested in the final checking of details and freight bills. These tally sheets usually give the car initial, car number, shipper's name, origin of shipment, date received, number of boxes, cartons, kegs, etc., and a general description. A detailed record of the material received in each box, carton, keg, etc., is made after the shipment is delivered to the section or stockman, opened, and the contents counted or weighed. These detail checks are usually made directly on copies of orders, copies of requisitions, or copies of combined order and requisitions. When these are not available, the material is checked in detail on tally sheets, or entered in a receiving record.

A bulk record as outlined above is made upon receipt of material purchased. A copy of this record is forwarded with the material to the stockman where the contents are checked in detail as to quantity, condition and description shown on the copy of the order. This is the official receiving record and the one retained as prescribed by the I. C. C. The receiving record is then passed along for posting in the stock record, for matching with the invoice and for establishing prices.

In case of partial shipments, abstracts may be made of each shipment received, the partial receipts entered on the receiving record and the abstracts passed along for posting in the stock record. The receiving record should be passed along to the next in line when the final shipment has been received. Where invoices for the material are turned over to the material receivers to check, the invoices may be matched with the receiving data for passing the invoice for payment. In this case when partial shipments are received, invoices can be approved and the copy of the receiving record held until final shipment is received, and then turned in.

In cases where material is received in advance of copies of orders, etc., it is suggested that a similar form be used as a receiving record and held until formal copies of orders, etc., are received, or used in tracing for invoices that do not come in promptly.

Transfers

When material is ordered by one store from another, a copy of the requisition may be furnished to the stockman or material receiver, for use as a receiving record. When material is received, a bulk record is made and it is then checked against the copies of the requisitions, as with purchased material. Where no requisitions have been made for the material, it may be checked against the invoices rendered by the shipping storekeeper, and if they are not available, then a receiving record may be made to be held until the formal billing is received.

A receiving record should be made of all material that is shipped in from line of road points, etc., without formal request, in order to provide a record against which any credit necessary or invoice that may come along later may be checked.

When shop-manufactured material is ordered, an extra copy of the order on the shops may be made for checking material receipts. The shops, when delivering material to the storekeeper, should furnish a delivery slip in duplicate, showing the quantity and the kind of material delivered, which the stockman or material receiver may sign, retaining one copy for his receiving record and returning the other to the shop foreman to place with the shop order to show that delivery has been made.

The committee consisted of J. S. Genther (chairman), general storekeeper, L. & N. E.; R. H. Lloyd, assistant to general storekeeper, D. L. & W.; D. H. Phebus, district storekeeper, C. M. St. P. & P.; W. E. Ruston, traveling storekeeper, B. & M.; E. W. Walther (chairman ex-officio), general storekeeper, B. & O.

Report on Storage Facilities

Material can deteriorate or be stolen at small points as well as the main stores and proper facilities should be furnished for the protection of these supplies. A small store, with standard shelving and platforms for outside material adjacent and with all items labeled, is suggested. A representative from the supply department should make visits to these points at intervals to see that proper care and protection are given to the material.

Ferrous metal stored outside should be protected by spraying. No weeds, tall grass, bushes or other growth should be permitted around the platforms. Machined parts should be coated with heavy grease or paint and inspected at intervals. Small hand tools should be protected from theft with locks. This can be arranged by having a special room or vault built inside storehouse, or a small section wired off. Requiring an old item before a new one is issued, throws a safeguard around such items after they are issued.

Journal Compound

Driving journal compound should be stored adjacent to, or if possible, in the oil house. New compound is furnished by the manufacturers in cartons weighing approximately 63 lb. and should remain in the cartons until required Second-hand or reclaimed compound should be kept in a covered container and should be used before the new. When the compound is pressed and formed in the perforated plate, the finished cake should be inspected and wrapped in paper.

Oilhouse materials should be inventoried monthly and checks made as to shortages. Gasoline and cylinder oils can be easily diverted to domestic use by employees unless proper accounting is made from the time these items are received until used.

Where the oilhouse is not adjacent to the storeroom and the oilhouse attendant is required to issue supplies for both, a small supply of items commonly called for should be placed in the oil room.

Recognizing the necessity for protecting the bearing surface of journal bearings, some manufacturers are shipping them in corrugated paper cartons without additional cost. These cartons give ample protection when handling and storing and, after removal, they can be used for shipping or storing relined bearings.

Non-Ferrous Metals

All non-ferrous metals, both new and scrap, should be protected from theft. Old material should be turned in before new is issued, or a satisfactory explanation given on the requisition. Where stores or shop delivery is practiced, the old material can be picked up when the new is delivered. Around car yards and inspection points, locked boxes of the proper capacity should be provided. In shops and roundhouses locked containers should be adjacent to the work. These containers should conform to the size and shape required for the handling equipment available and should be emptied or removed to the central storage daily.

Excess handling of scrap decreases its value. For this reason, the transferring of scrap from origin to a central dock is an item of expense that should receive careful study. Consideration should be given to the nature of the scrap and the facilities for handling—keeping in mind the possibility of handling only twice—loading and dumping.

Lumber Storage

Many different bearings for storing lumber on the yard are in use. When renewing old bearings or constructing new ones, bearings constructed of concrete pedestals and old rail are preferred. A bearing of this construction lasts almost indefinitely, and can be moved from place to place, if desired. Lumber under 2 in. in thickness should have a bearing at least every 4 ft. 4 in. of its length, or less. Lumber, 2-in. to 6-in. should have bearings not more than 8 ft. 6 in. Lumber over 6-in. may safely have bearings spaced 12 ft. or 13 ft. apart. Bearings for lumber up to 24 ft. should have an elevation pitch of not less than ½ in. for each foot.

In piling lumber, it should be separated as to grades, sizes and lengths. Strips should be placed between each layer over the bearing and air spaces of not less than ¾ in. left between each piece. The ends of the first course of lumber should be brought flush over the center of the front bearing. Each succeeding course should project not less than ⅛ in. All piles of one-inch boards, dressed car flooring and two-inch plank should be protected from the sun and rain by rough boards laid in two courses, with the cracks in the lower course lapped by the boards

(*Continued on page 162*)

Long Trains of Heavily Loaded Cars Moving at High Speeds Subject Rail to Increasingly Severe Service

Means to Prolong Rail Life Featured in Investigation*

Fourth progress report on study of rail failures, sponsored by the railways and rail manufacturers, gives major attention to end batter and end hardening

By Dr. H. F. Moore

Research professor of Engineering Materials, University of Illinois, in charge of investigation

THE first three progress reports of the Investigation of Fissures in Railroad Rails, being conducted jointly by the railways and the rail manufacturers, have concerned themselves mainly with the problem of internal fissures in rails†, while in this fourth report major consideration is given to the studies which have been made of rail-end batter and end-hardening, and of several closely related subjects. In the earlier reports, evidence was offered to show that in the starting of the spreading to fracture of internal fissures in rails, the presence of minute shatter cracks in the rails as rolled, and the occasional heavy wheel loads to which rails are subjected in service, are two factors of prime importance. Evidence was also presented indicating that it is the direct action of wheel loads, rather than the bending moment in the rail, which starts the spreading of a shatter crack to fracture, but it was pointed out, however, that high bending stresses accelerate the rate of spread. This theory has been shown to be consistent with the mathematical determination of stresses under car wheels; with the fatigue strength of rail steel weakened by small cracks; and with the laboratory production of fissures in rails. It is also consistent with results reported from service. Studies of both the controlled-cooling and normalizing processes indicate that they are highly effective in preventing the formation of shatter cracks in the process of rail manufacture.

Extensive statistical studies of wheel loads in service have been made at four test locations by measuring the strains in rails with recording extensometers of the scratch type. These studies indicate, in a very general way, that at any given point on a rail, one wheel load out of one thousand equals or exceeds 40,000 lb.,—the lowest value which produced fissures in shatter-cracked rails in laboratory tests. The studies also indicate that at certain "bad" locations, the frequency of high wheel loads may be two or three times as great as the average.

The importance of the production of rails free from shatter cracks and of the reduction of fissures developed, by the more careful maintenance of both the track and rolling stock, has been emphasized. Extensive studies of the physical properties of rail steel have been made at various temperatures, including temperatures as low as—40 deg. F. The loss of ductility and toughness in rail steel at low temperatures has, as the result of these tests, been shown to be quite marked. Other studies carried out by the investigation have had to do with the ac-

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* Abstract of the Fourth Progress Report on the Investigation of Fissures in Railroad Rails, published in Bulletin 404 of the American Railway Engineering Association.

† Abstracts of the first three progress reports on the Investigation of Fissures in Rails were published in issues of the *Railway Age* of August 31, 1935, page 269; July 4, 1936, page 25; and June 12, 1937, page 980, respectively.

ceptance tests for rails, and these have led to the conclusion that a bend test in a testing machine is a better test than the present standard drop test.

Controlled-Cooling of Rail

Through the co-operation of the department of metallurgy and research and the rolling department of the Tennessee Coal, Iron & Railroad Company, a preliminary series of tests has been carried out at the Ensley mills of this company to study suitable temperature limits for the controlled-cooling of rails, employing specially constructed wood cooling boxes and insulating material, and thermocouples which could be quickly clamped to the tops of the various rail specimens. Twenty of these special boxes, together with clamps and thermocouples, were built for use in the mill experiments.

In carrying out the experiments, two "A" rails were taken from each of several heats of steel. Each rail was cut into twelve 2-ft. test specimens, thus furnishing 24 specimens per heat. One 2-ft. length (a "control" specimen) from each end of each of the two rails of a heat was cooled on the mill floor. The remaining 20 specimens were cooled in boxes, as already pointed out.

Based on the results of the tests, the following conclusions could be drawn from the study at the Ensley mill.

(1) Rail specimens cooled in air to temperatures above 300 deg. F. before being placed in boxes, developed no shatter cracks.

(2) Rail specimens placed in boxes after specimens had cooled to 200 deg. F. did develop shatter cracks—evidence that the cracks formed between 300 deg. F. and 200 deg. F.

(3) Rail specimens placed in boxes at 900 deg. F. and removed at 600 deg. F. or lower, showed no shatter cracks, while specimens taken out at 800 deg. F. and 700 deg. F. developed shatter cracks, the shatter cracks developing during the cooling from 700 deg. F. to atmospheric temperature. This seems to indicate that while shatter cracks actually did not form above 300 deg. F., nevertheless, slow cooling above that temperature was effected in inhibiting their formation below that temperature.

(4) In all of the tests shatter cracks developed only in those rail specimens which cooled from 900 deg. F. to 200 deg. F. in less than four hours.

(5) Placing the rails in controlled-cooling boxes at temperatures of 900 deg. F. or below did not lower the Brinell hardness of the rails. This is in agreement with the results of tests on 75 pairs of controlled-cooled and air-cooled rails tested previously.

Based on the results of these preliminary tests of rail specimens from only one mill, it could be concluded that the present practice of most mills of keeping rails in control-cooling boxes from 24 to 36 hours might be somewhat modified. However, none of the heats of steel used in these experiments developed half as many shatter cracks as some of the worst test heats examined previously during this investigation. Therefore, it cannot be concluded that these results would apply to all heats of rail steel.

In view of the fact that transverse shatter cracks were found in only four of the control specimens used in the Ensley mill tests, it seemed desirable to make further tests before suggesting any modification of the limiting temperatures or cooling rates for the control-cooling process. Therefore, a second series of tests were carried out at the mill of the Dominion Steel & Coal Corporation, Ltd., at Sydney, Nova Scotia. These later tests have been completed, but the results have not yet been compiled.

Since the beginning of the study of end-hardened rails in January, 1937, 148 specimens of end-hardened rails have been received for laboratory tests, including rolling-load tests.

Laboratory Tests of End-Hardened Rails

These specimens represent 12 different end-hardening processes as indicated in the following, Processes 1 to 6, inclusive, being representative of the end-hardening processes applied at six different rail mills during fabrication of the rails, while Processes 7 to 12, inclusive, are representative of methods of end-hardening of rails in track.

Process 1—Electric induction heating, employing a warm water quench.

Process 2—Gas reheating, employing an air quench.

Process 3—Quenched from rolling heat with water spray.

Process 4—Cooled below critical temperature, gas reheated, followed by a water spray quench.

Process 5—Natural gas reheating, employing an air and steam quench.

Process 6—Normalized rails, employing an air quench.

Process 7—Machine-held oxy-acetylene burners, with self quench.

Process 8A—Combined building up of battered ends and end-hardening, employing oxy-acetylene welding and air cooling.

Process 8B—Same as Process 8A, except that before the rails have cooled appreciably, the ends are reheated to cherry red and then quenched with water from a perforated pail.

Process 9—Free-held torch on new rails, employing a water quench.

Process 10—Automatic heating and quenching machine.

Process 11—Oxy-propane torch, employing a water quench.

Process 12—Oxy-acetylene torch heating, with air quench.

As a result of metallographic and hardness tests of rail ends, end-hardened by the foregoing processes, the following general conclusions can be drawn:

(1)—Quenching the rail end when the entire rail is above the critical temperature resulted in a rather large and deep hardened zone; otherwise the heat remaining in the body of the rail might be expected to temper the small volume of quenched metal to a rather low hardness.

(2)—The size of the hardened zone of rail ends reheated for hardening depends upon the rate and method of reheating. The electric induction, oxy-acetylene and oxy-propane flame methods allowed rapid heating of a small volume of steel to above the critical range, while the producer-gas and natural-gas processes heated the rail head to a considerable depth before the surface metal was above the critical range, ready for the quench.

(3)—Water quenching developed maximum hardness in rail steels, but the hardness was controlled over a considerable range by varying the amount and temperature of the water used. In many cases the hardened area was tempered by heat from the metal below the quenched zone, but in Process 9 tempering was done by reheating.

(4)—Compressed air quenching has been used to produce Rockwell "C" hardnesses of 45 when a comparatively shallow zone of the rail head was heated. When a larger volume of metal was heated, as in Process 2, a maximum hardness of 42 Rockwell "C" was produced, but for most rails the hardness fell within the range of 37 to 40 Rockwell "C."

(5)—In Process 5, steam was added to the compressed air for quenching. It would seem that this addition might be troublesome due to the condensation of the steam.

(6)—Quenching by conduction of the cold metal can only produce appreciable hardness when the heated zone is quite shallow.

Mechanical Tests of End-Hardened Rails

Mechanical tests have been made of specimens from rails end-hardened by the 12 different mill and field processes mentioned in the foregoing paragraphs. The mechanical testing program covered the application of four types of tests to all end-hardened rail samples submitted where the process of end-hardening produced an amount of end-hardened metal sufficient to procure the

necessary test specimens. These four types of tests included those of unnotched bars on a Charpy impact machine; tests of notched bars on an Olsen-Izod machine; fatigue tests; and tension tests.

Examination of the results of these various tests shows that, with the exception of rails treated by Processes 8A and 8B, the effect of the end-hardening methods resulted in increased toughness (Charpy impact values) for the material treated by all mill and track end-hardening processes. All mill hardened rails showed increased ductility, as indicated by elongation and reduction of area values obtained by tensile tests of the hardened material. In view of the increased hardness of the end-hardened material, these are somewhat surprising results. This improvement of toughness and ductility can be accounted for by the improved micro-structure brought about by the heat treatment imposed by the processes of end hardening. As might be expected, increased tensile and fatigue values accompanied the increased hardness of the end-hardened material.

The tests of the rail samples treated by Processes 8A and 8B showed decreased toughness of the hardened materials, as given by the impact tests, and decreased ductility as measured by elongation and reduction of area in the tensile tests, over the toughness and ductility values obtained from the unhardened portions of the rails. These results are in direct opposition to those found for all other rails treated by the other processes. That the rails end-hardened by Processes 8A and 8B had been subjected to a considerable amount of traffic before being built up at the ends by welding, followed by subsequent end-hardening, suggests that the hardening of built-up rail ends may not improve the mechanical test properties of the metal. It may be that the hardness due to cold rolling of the rail treads tends to reduce toughness and ductility, while hardness brought about as the result of proper heat treatment may add strength without loss of these valuable properties. Other than in the case of the rails treated by Processes 8A and 8B, none of the other end-hardening processes studied appeared to embrittle the steel in the specimens tested, but rather improved the toughness and ductility of the specimens.

Effect of Hardness of Rail Steel

Studies have been made with the purpose of providing information to determine, in part at least, the limits to which the hardness in end-hardened rails might be carried and still retain good strength, ductility and toughness in the rail steel. These studies consisted of tension tests and Charpy impact tests on several series of specimens of rail steel heat-treated in the laboratory to cover the range of hardness from that of untreated rail to a maximum of 65 Rockwell "C" hardness.

From an analysis of the results of the tensile and impact tests, and the values derived therefrom, it appears that the usable hardness of rail steel is exceeded beyond a value of Rockwell "C" 52 (Brinell 483) and that maximum toughness occurs at a hardness of approximately Rockwell "C" 40 (Brinell 368). While the test party is not yet ready to make recommendations for hardness ranges allowable in end-hardening practice, the values given may be used as a guide, and, as indicated by the tests, it is probable that the maximum value of Rockwell "C" 52 should not be exceeded.

Rolling-Load Tests for Batter of Rails

During the last year, rolling-load tests have been made on a number of joints made up of rails whose ends had been hardened by various end-hardening processes, with similar tests on companion unhardened rails. As a result of preliminary tests in this regard, all tests of this character are now being made under a wheel load of 40,000 lb., and instead of the simple-beam support used in the earlier tests, (described in the Third Progress Report of the Investigation) an additional support is being used directly under the joints. This solid support avoids some uncertainties in the effects of the joint bars.

With one exception, the tests conducted and the results secured cover only one sample of each of the end-hardening methods. For this reason, *no attempt should be made to evaluate the relative merits of the various end-hardening methods until the tests have been carried further and more results have become available.* The only conclusion which may be drawn at the present time from the rolling-load tests is that end-hardening is an effective method of reducing the batter of rail ends, providing the proper hardness is attained. However, the results secured from the rolling-load tests are, in general, in harmony with the field service report received from one road to the effect that end-hardening is not effective unless the hardness is greater than 300 Brinell (approximately 31 Rockwell "C").

Purchases and Stores Division Reviews Year's Work

(*Continued from page 159*)

of the upper course. They should be laid upon strips so that the roof will be about 6 in. about the top of the pile at the front end and 2 in. at the rear.

Hardwood stored in dry lumber sheds should be stripped for air circulation, if there is any question as to the moisture content. All hardwoods should have the ends painted with a good grade of oil paint to prevent checking.

The committee consisted of L. F. Duvall (chairman), assistant general storekeeper, A. C. L.; G. W. Alexander, general storekeeper, C. of G.; J. J. McKinnon, storekeeper, B. & M.; F. W. Reynolds, district storekeeper, B. & O.; L. C. Thomson, manager of stores, C. N.; and, C. B. Tobey (chairman ex-officio), general storekeeper, L. V.

Report on Price Extras

The subject of quantity price differentials was assigned to a committee of the Division for the first time.

The application of quantity price differentials merits the earnest attention of every railroad employee ordering and using materials and supplies and storekeepers and others originating requisitions should be made aware of the possible savings. When requisitions or orders are in preparation the quantity should be compared with the differential in the next bracket, as in some instances an increase in the quantity may earn a differential sufficient to pay or nearly pay for the extra quantity. Savings may also be made by ordering in carload lots.

The financial condition of the railroad and the usefulness of the article should be considered. It is unwise to increase the quantity if the material is not required for a very long time, or if its ultimate use is doubtful.

Investigation discloses that practically everything manufactured and sold carries a quantity differential and that in many cases different locations have different extras. This may result from the practice of some railroads buying through merchants or jobbers, while others buy direct from the mill or manufacturer. There are so many instances of this kind that it is not practicable to list all of them.

The committee prepared a list of standard extras and recommended that a copy be placed in the hands of storekeepers and others originating requisitions and a suitable record be made in the stock book or stock card.

(The list, comprising 50 letter sized pages of compactly ar-

ranged tables giving the extras for items in all the material classes, has been omitted from this abstract of the report for lack of space except for the inclusion of one table to indicate the work of the committee.)

Rivets—Steel, ½ in. Diam. and Larger

1,000 lb. or more	Base
*600 lb. to 999 lb.	$.20 per cwt.
*400 lb. to 599 lb.	.35 per cwt.
*200 lb. to 399 lb.	.70 per cwt.
100 lb. to 199 lb.	1.50 per cwt.
50 lb. to 99 lb.	3.00 per cwt.
Less than 50 lb.	4.00 per cwt.

* These extras do not apply on the stock sizes of button and cone head rivets.

The committee consisted of O. L. Browne (chairman), assistant to purchasing agent, A. C. L.; L. J. Ahlering, purchasing and stores agent, C. & E. I.; W. A. Clem, purchasing agent, Reading; F. I. Foley, general storekeeper, N. Y., N. H. & H.; J. W. Hagerty, general supervisor, purchasing department, Penna.; T. A. Hodges, general storekeeper, S. A. L.; C. C. Hubbell, general purchasing agent, D. L. & W.; E. A. Jones, purchasing agent, L. V.; F. W. Pettit, assistant to general purchasing agent, W. M.; and E. J. Lamneck (chairman ex-officio), purchasing agent, Penna.

New Books . . .

No Royal Road, by Edgar A. Custer. 428 pages. 8¾ in. by 5¾ in. Bound in cloth. Published by H. C. Kinsey & Company, New York. Price $3.50.

This work is the autobiography of a locomotive man who lived a full and adventurous life in America's tempestuous decades and introduces to the reader a person who could take the lead in church choirs and still remain the town's best poker player, and who, in his span of years, attained success as a railroader, a political cartoonist, an inventor, an industrial consultant, an army officer, and a foundry-owner.

The book gives a picture of the Baldwin Locomotive Works in the days of compounds and speed trials—and relates the experiences of a youth who served under the young Vauclain at Altoona works. Readers of this work will come in contact with a great personality who "went through the mill" in railroad shops and on the road and who has witty and discerning things to say about railroading as it was in the 'Eighties. He tells absorbing yarns about a typical, tough wrecking-master whose home in the hills was a seat of culture and quiet luxury; about the famous wreck of the Niagara Falls excursion train at Silver Creek, N. Y., the scene of which he reached shortly after the catastrophe; about the difficulties of "getting things through" during the war; of rain and cold and jealous operating officers when Baldwin's sent him out to test locomotives.

Railroaders will especially enjoy Mr. Custer's detailed narration of his days as an apprentice in Altoona Works. Once, for example, he relates that his boss, Vauclain, dragged him by the ear to finish squaring bolt heads and, curiously enough, a few days later reversed his policy and gave him complete charge of laying a boiler foundation, though the blue-print was "all Greek". The later days at Baldwin's carried plenty of excitement, too, and the author tells of a test run on the Erie when the locomotive blew out a front cylinder head and, along with it, the author, who was making tests on the front end.

Underlying these adventurous anecdotes there is evidence of a critical and observant mind which carries the book to a higher level than the usual collection of adventures. There is a foreword by Mr. Vauclain.

Motor Traffic Management, by H. E. Stocker. 412 pages. 9 in. by 6 in. Bound in cloth. Published by Prentice-Hall, Inc., New York. Price $5.00.

Somewhere in the middle of this book the author writes: "The railroads are suffering because they are an old industry; the motor transportation industry is suffering because it is a comparatively new industry." It is to fill the needs of the "new industry" that he has made it his business to set up a workable plan for the administration of motor transport companies. This he has done in a simple, easily-read style and has "avoided the use of terms which are not generally known." The result is a practical working volume which is an attempt "to answer questions raised by those who are faced with immediate problems and who, at present, do not have the time necessary to analyze them thoroughly."

In pointing the way for the infant motor transport field, Professor Stocker makes it clear that the truck and bus operators cannot "start from scratch" but must consider the experiences of that older transport medium—the railroads. It is in this respect that *Railway Age* readers will find "Motor Traffic Management" worth attention. The work makes constant reference to the railroad industry, not to disparage, but to weigh and appraise. Two entire chapters are devoted to detailed comparisons between the motor and railroad fields. Again, in the latter part of the book, which concerns the theory and construction of freight rates, the author necessarily leans heavily on railroad practice for adequate presentation.

On the other hand, the author does not advocate wholesale adoption by the motor operators of railroad procedure. He argues that highway transport has its individual problems which will have to be solved to some degree by the hard road of trial and error. Such special problems as irresponsible small-scale operators and state weight and size restrictions have no precedents to pivot on, and require, therefore, new approaches.

The chapter on federal regulation of motor transportation is excellent source material for one who is hazy about Motor Carrier Bureau procedure and contains some interesting comments on I. C. C. decisions and aims. The chapters dealing in detail with the working staff set-ups of the larger motor transport concerns contain suggestions, comments and illustrations that ought to interest readers employed by other transportation agencies as well as the truck operators for whom they were written directly. Thus, the distinction which many highway truck organizations maintain between the functions of the *traffic* and *sales* departments, respectively, might well offer suggestions for railroad organization practice.

Men and Iron, by Edward Hungerford. 424 pages. 9½ in. by 6½ in. Bound in cloth. Published by Thomas Y. Crowell Company, New York. Price $3.75.

Under this title Mr. Hungerford has written the history of the New York Central, lines east of Buffalo, N. Y., accompanied by a brief discussion of the "Big Four," only as is necessary for a complete picture of the system. Fortunately, the preface hints that a sequel volume may tackle the interesting western properties of the Central at a future date.

The title,—"Men and Iron"—finds its origin in a statement made by the late A. H. Smith, president of the New York Central, to the effect that "this railroad is ninety-five per cent men—and five per cent iron." The author indeed gives the men of the Central their 95 per cent's worth; the iron itself, however, is by no means ignored and there is a plentiful quota of dates, mileages and rolling-stock rosters to interest the student of the railroad property itself. Historians usually find it difficult to chronicle the lives of great corporations; they either lose themselves in a welter of dates and contracts and annual meetings or, in the effort to turn out interesting reading, run far afield from their original purpose, to deal exclusively with personalities. Mr. Hungerford has succeeded in avoiding both pitfalls and has produced a work which is neither technical nor romanticized, neither dull nor racy.

While presenting a clear picture of the chronology of the whole New York Central enterprise, the work at the same time avoids the bad artistry of mere year-to-year presentation by gathering up the separate projects which make up the whole story into individual units. The dreamer, George William Featherstonhaugh, whose early efforts to build a railroad through the Mohawk valley set the ball rolling in New York Central history, receives a chapter by himself. Each of the seven

"links" in the Albany-Buffalo railroad chain,—the Mohawk & Hudson, Utica & Schenectady, Syracuse & Utica, Auburn & Syracuse, Auburn and Rochester, Attica & Buffalo and the Tonawanda—is afforded its due in turn. The early efforts of these roads toward co-operation, as represented by the Albany "convention" of 1843, and, finally, their consolidation as the New York Central in July, 1853, bring the first phase of the story to a close. Incidentally, the illustration on the book wrapper is that of the first special excursion train operated over the united tracks of the "seven links," thus serving to symbolize the drift of the railroad's history.

A few short interludes, and the author comes to the hero of his work—the redoubtable Commodore Vanderbilt. Few authors have ever afforded more unstinted praise to an idol than has Mr. Hungerford given this great organizer and combiner of railroads. Up to this point in the book, characters are subsidiary to railroads; with the advent of the Commodore, the physical aspects become secondary to the human. Thus, is the tale of the New York & Harlem, and its essential status as a terminal property, reviewed and the rise of the Hudson River road and its fight against steamboats portrayed. Finally, another great date, that of the consolidation of the Hudson River with the Central in 1869, is reached and another phase of the railroad's history closed.

Succeeding chapters tell of the incessant expansion and strengthening of the now-enlarged system. They abandon the thread of straight chronicle at times, however, to recount fresh and new anecdotes of eccentric superintendents—like the one who always wore a blue conductor's uniform and a military cap with "Superintendent" in gold letters emblazoned on its front—of rate scraps with rival roads, and of the qualities and achievements of successive officers. Furthermore, the emphasis shifts from mere geographical growth to the speeding up of trains, the development of new operating techniques and the essential modernization which characterized the latter quarter of the century.

Returning for a while to the story of mileage expansion, Mr. Hungerford tells of the West Shore road and its early entrance into the Central family and touches briefly on the Big Four as a western arm of the system. Histories of the Rome, Watertown & Ogdensburgh and the Boston & Albany complete the genealogy. There follow a chapter on the "Twentieth Century Limited," the system's premier train and a detailed account of the three successive Grand Central terminals in New York city. In the closing paragraph, Mr. Hungerford, thinking of the bronze statue in front of the present terminal, takes last leave of the Commodore and of his New York Central. "Through distant towns and cities and states, his railroad labors unceasingly summer and winter, all the day, all the night; it serves man and his industries faithfully, tirelessly. So has the dream of one man come true."

The Railway Age, by Cyril Bruyn Andrews. 145 Pages. 10 in. by 7½ in. Bound in cloth. Published by Country Life, Ltd., London. Price 12 shillings, 6 pence.

This business of railroading has meant far more to its age than the mere transportation of goods and men. In fact, the far-flung organism of the railway has affected the entire structure of social life; levelled and reduced caste boundaries; inaugurated and nourished a particular type of art and decoration; and formed the subject of countless literary products. To emphasize that this has been true in Great Britain, at least, is the chief aim of the author of "The Railway Age" in producing a work which, by reason of the fineness of its format, the beauty of its many illustrations and the general tone and atmosphere of its text, may well be said to be one of the most unusual and artistic works ever to be entered in the bibliography of railroad books.

It is such chapter headings as "The Effect on the Lower and Upper Classes" and "Art and Decoration" and illustrations of the panelling of the L. M. S. board and committee rooms at Euston Terminal in London and the curious fronts of railway stations that set the work apart from the more mechanical-conscious railway histories. It is Mr. Andrew's opinion that in a great number of railroad engineering feats of the nineteenth century, such as bridges, culverts and tunnel entrances, the British carriers created a new artistic mode which left its mark on the century and even today plays an important part in the typical English landscape. In illustration, he points to Brunel's famous high viaducts, to the Gothic Bridge at Conway, and to the so-called "box" tunnel entrances. Stations and their architecture also loom large in the book, especially such memorable Victorian achievements as the original portico of Euston and the conservative old Royal Hotel of the Great Western.

The work also quotes songs and poetry written in the railway hey-days, reproduces famous paintings and sketches by celebrated masters having a railway background, and cites literary references to the steam roads as social forces.

The Re-organization of the American Railroad System, 1893-1900, by E. G. Campbell, Ph.D. 366 pages. 8¾ in. by 6 in. Bound in cloth. Published by the Columbia University Press, New York. Price $4.50.

Those having concern for the growing host of carriers in bankruptcy or trusteeship and desiring historical background for their studies will find in this carefully worked out analysis the annals of that series of railroad failures and re-organizations which characterized the period 1893-1900. It is doubtful whether many parallels may be traced between the two periods; the causes of our present railroad insolvency plague are of a different breed. But there may well be gleaned from the study of the re-organization plans of the Nineties (which the author presents in great detail) and the outcome of their application, grist for the mill of present Section 77 proceedings.

Furthermore, it should be pointed out that the book does not limit itself to the monotonous reporting of "putting railroads back on their feet," but, by the nature of its material, must devote a great deal of space to the widespread consolidation of properties which, as a natural concomitant of re-organizations, produced the greater number of the large systems which have dominated the railroad picture since the turn of the century. The book, therefore, serves as the record of that period when "combination" and its attendant benefits and injustices "ruled the roost."

In the effort to channelize his copious notes, Mr. Campbell has grouped the roads under consideration according to the causes he attributes to the failure of each. Thus he attributes the failure of the Norfolk & Western and the Northern Pacific to over-expansion of properties, and groups them so; the Erie, the Santa Fe and the Union Pacific he places under the head "Past Mistakes"; while to the Baltimore & Ohio and Philadelphia & Reading failures he attaches the title "Scandals."

The discussion of these failures takes up approximately the first half of the book. The second is devoted to the attacks made on the financial chaos and the careful upbuilding of the Morgan, Hill, and Harriman systems. Chapter VIII injects a happier tone into the work by narrating the experiences of an impressive list of roads which found the 1893 depression cause for but a slight decrease in the amount of dividends and who made the most of a period of depressed values for making judicious purchases in the enlargement of their systems. An interesting chapter on small railroads follows, and a summary of developments during the Nineties in financial structures, inter-corporate relations, banker control and government regulation ends the book.

It is Mr. Campbell's conclusion that most of the railroads which failed during and immediately after 1893, did so not because of the panic and ensuing depression, but because they had been bankrupt *de facto* before 1893. Therefore he characterizes the depression as distinctly "purgative". Even more important, in the re-organization activity which followed the various bankruptcies, he finds the foundation for the combination of the greater part of our railroad mileage into groups controlled by the great "interests."

The book is by no means oppressively academic; the author has a sensitive appreciation of the personalities involved in the tangled skein of his narrative and passes on his perceptions in interesting paragraphs,—almost parentheses—which serve to break up the long record of re-organization plans, bond defaults, and other financial complexities. The latter themselves are boiled down to a series of short readable narratives, which, together with well-chosen extracts from current financial and railroad journals, make an absorbing story of what, less skilfully handled, might be a pretty monotonous account.

NEWS

Rock Island Plan Submitted to I.C.C.

Reorganization plan of Protective Committee would wipe out common stock

A plan of reorganization for the Chicago, Rock Island & Pacific which would wipe out the common stock and reduce the road's funded debt from $331,374,432 to $182,951,771 and reduce the interest charges from $69,185,942 to $1,598,547 for the first five years and $2,874,580 subsequently was placed before the Interstate Commerce Commission when hearings on the road's reorganization were resumed before Commissioner Porter on July 20. The plan was filed by the protective committee for the road's first and refunding mortgage four per cent bonds and secured 4½ per cent bonds, Series A, of which Dwight S. Beebe, vice president of the Mutual Life Insurance Company, is chairman.

The plan also revealed that the Rock Island contemplates spending $22,772,650 on a program of new equipment purchases and rehabilitation of ways and structures which is to run to 1942. Some $8,000,000 of deferred maintenance has already been completed.

Under the new plan the company would issue the following securities: $2,040,000 of 3½ per cent equipment trust certificates, series R, 1939-1947; $24,338,350 of 3½ per cent, 10-year certificates; $1,190,236 of four per cent equipment purchase contracts; $383,185 of three per cent equipment purchase contracts; $55,000,000 of first mortgage four per cent bonds; $100,000,000 of general mortgage 4½ per cent convertible income bonds; $120,000,000 of five per cent convertible preferred stock; 780,985 shares of common stock, at a stated value of $100 a share.

An explanatory note to the committee's plan points out that the present stock of the road has no actual value and therefore is not entitled to any share in any of the new securities. The new first mortgage bonds will pay contingent interest for five years, which is one year more than the period of the rehabilitation program, at the end of which period, the railroad expects to realize substantial savings.

Under the proposed plan, the general mortgage bonds would receive $182.88 in new mortgage bonds and the remainder in income bonds and preferred stock. The first and refunding bonds would receive $117.80 in first mortgage bonds and the remainder in income bonds and preferred and common stock. The secured 4½ per cent bonds, Series A, would receive $131.73 in new first mortgage bonds and the remainder in income bonds and preferred and common stock.

Reconstruction Finance Corporation loans would be repaired on the basis of $448.93 in new first mortgage bonds and $752.60 in income bonds. Bank loans would receive $411.63 in first mortgage bonds and $891.33 in income bonds. The road's 30-year convertibles would be paid off in new common stock as would the road's other general creditors.

"Agreed Charges" September 1

Dominion regulation of transport in Canada by air and on the water and also permitting the railways to make "agreed charges" with various shippers excepting on grain will become effective on September 1.

The first part of the new transport bill became effective on the measure getting royal assent at the end of the session. That part deals with the creation of a board of transport commissioners to take the place of the present Board of Railway Commissioners.

The parts of the act dealing with control of air and water transport and with "agreed charges" were to come into operation by proclamation and it is understood they will be proclaimed effective on September 1 of this year.

Last year Transport Minister Howe introduced similar legislation but it was killed. It was opposed chiefly because it sought to regulate interprovincial highway traffic and bulk as well as package freight on the Great Lakes.

When introduced this last session these two provisions were omitted to facilitate passage, but before the act emerged from the Senate, grain movement on land as well as on water was exempted from the bill, and also control over water transport between the two coasts through the Panama Canal was exempted.

I. C. C. Ruling on Indiana Railroad

The Interstate Commerce Commission, Division 3, has found that the Indiana, an electric line, and its receiver do not fall within the terms of the exemption proviso in the first paragraph of section 1 of the Railroad Retirement Act of 1937, the Carriers Taxing Act of 1937, and the Railway Labor Act, as amended.

Says Stock Yard Is Subject To Act

I. C. C. holds that Chicago firm has the status of a common carrier

Reaffirming its decision of December 11, 1935, the Interstate Commerce Commission on July 16 decided that the Union Stock Yard & Transit Company of Chicago is a common carrier subject to the provisions of the Interstate Commerce Act. The company had contended that it was not subject to the commission but only to the Secretary of Agriculture under the Packers & Stockyards Act. The commission also found that the proposed cancelation of the company's tariffs naming loading and unloading charges on livestock at the Union Stock Yards in Chicago was not justified and canceled the suspended schedules and discontinued the proceeding.

Chairman Splawn, who wrote the majority decision, pointed out at the outset of his opinion that the issue in the case was whether the company was a common carrier by railroad subject to the provisions of the Interstate Commerce Act in respect to the services it performs at the Union Stock Yards in Chicago in connection with the loading and unloading of carload shipments of livestock transported by the railroads in interstate commerce to and from the stock yards.

He also stated that the status of the company as a common carrier subject to the act had been determined by the Supreme Court of the United States and also by the commission on several occasions. In June, 1935, the company proposed to cancel all its tariffs on file with the commission. The tariffs contained the charges assessed and collected by the company for the loading and unloading of livestock at the Union Stock Yards. The cancellation supplements bore the notation, "No tariffs of this company will hereafter be filed with the Interstate Commerce Commission". The operation of these supplements was suspended and a hearing was held. On December 11, 1935 the commission found that the company came within the provisions of the Act and was required to file its tariffs with the commission.

Following this decision, the company filed a petition for rehearing, reconsideration and reargument. The chief basis for the request for further hearing, according to Chairman Splawn, was an offer to prove that the commission had not required the filing of loading or unloading tariffs by

(*Continued on page 171*)

Roads To Charge For C. & D. Service

24 carriers file new tariffs with charges ranging from 5 to 10 cents

Twenty-four carriers in Official Territory have decided to discontinue free pick up and delivery service and have filed new tariffs with the Interstate Commerce Commission effective August 15, which will make charges for this service. Also, these carriers will cease the practice of making an allowance to consignees or consignors for performing the pick up and delivery service in lieu of that offered by the railroads.

The carriers filing the new tariffs are the Boston & Albany; Chicago Junction; Chicago, Kalamazoo & Saginaw; Cincinnati Northern; Cleveland, Cincinnati, Chicago & St. Louis; Cooperstown & Charlotte Valley; Delaware & Hudson; Indiana Harbor Belt; Louisville & Jeffersonville Bridge & Railroad; Michigan Central; New York Central; Pittsburgh & Lake Erie; West Shore; Aroostook Valley; Bangor & Aroostook; Belfast & Moosehead Lake; Boston & Maine; Canadian Pacific; Central Vermont; Maine Central; Rutland; Montpelier & Wells River; St. Johnsbury & Lake Champlain; Springfield Terminal; and the Suncook Valley.

To date no similar tariffs have been filed by the New York, New Haven & Hartford; Pennsylvania, Baltimore & Ohio; Chesapeake & Ohio and other roads operating in the same territory. Considerable speculation exists as to whether or not these other carriers will follow the example of the above-mentioned roads and file similar tariffs. If they do not, the situation will obtain where in certain cities one road will make a small charge for pick up and delivery service while its competitor will do the service for nothing. How long this could continue no one at the commission would hazard a guess; but it is generally felt that the other roads will follow suit in a short time.

The new tariffs provide different charges for pick up or delivery service in different cities. For example, the charge in Boston is fixed at 10 cents per hundred pounds, while in Albany, N. Y., it is 7½ cents and in Lowell, Mass., 8 cents. The minimum charge in the tariff schedules is five cents per hundredweight and the maximum is 10 cents.

At the present time the carriers give shippers free collection and delivery service on less than carload freight on which the freight rate is 45 cent per 100 pounds or higher. Also, the railroads allow shippers a deduction of five cents per hundred pounds if they wish to perform the service themselves. Under the new tariffs no such allowance will be made.

From the tariffs it appears that the railroads have decided upon a pick up or delivery charge on a graduated basis according to the size of the cities in which the service is performed. As an example, the following cities will have a 10 cent charge: Boston, New York, Chicago, Cleveland, St. Louis, and Buffalo. A charge of 7½ cents will apply to such cities as Albany, Toledo, and Nashua, N. H., 6½ cents is specified for Kalamazoo, Mich., and Troy, N. Y.; and five cents for Augusta, Me., and Waterbury, Conn.

Railroad Retirement Account

The Daily Statement of the United States Treasury for July 11 carries the usual monthly tabulations of the Social Security Account and the Railroad Retirement Account, showing that the latter had received up to that date a total of $150,477,279.13 from taxes on carriers and their employees. Meanwhile the Railroad Retirement Board has spent $4,375,630.85 for administration expenses and made benefit payments totaling $79,849,056.18.

Commission Denies Clerks' Plea In Express Case

The Interstate Commerce Commission has denied the petition of the Brotherhood of Railway Clerks for a re-hearing and re-argument of the proceeding wherein the commission recently authorized the Railway Express Agency to absorb the operations of the Southeastern Express Company. The commission's decision was reviewed in the *Railway Age* of June 11, page 985.

Motor Safety Order Is Stayed

The Interstate Commerce Commission, Division 5, has stayed, pending further order of the commission, a proposed report of Examiner R. W. Snow's which recommended that the commission make three findings in connection with safety regulations to be prescribed for motor carriers otherwise exempt from federal regulation under section 203 (b) of the Motor Carrier Act. The recommended findings were carried in the *Railway Age* for July 2, page 24.

Chicago Hearing on Express Rates September 9

The Interstate Commerce Commission has set September 9 as the date for a Chicago hearing in connection with its Ex Parte 126 investigation of the Railway Express Agency's petition for a readjustment of its rate structure. Other out-of-Washington sessions were previously assigned for Birmingham, Ala., San Francisco, Calif., and Cheyenne, Wyo., as announced in the *Railway Age* of July 16. Commissioner Aitchison will preside at the Chicago hearing.

Wheeling & Lake Erie Now "Freight Only" Line

The last run of a passenger train on the Wheeling & Lake Erie was made on July 17, when No. 32 completed a round trip from Cleveland, Ohio, to Wheeling, W. Va. About 350 passengers were on the train. For some time, only one passenger train a day in each direction has been operated between Cleveland and Wheeling, and after a steady decline in patronage, the Interstate Commerce Commission granted the road permission to abandon this service.

Motor Act Doesn't Control Forwarders

I. C. C. reverses Division 5's finding that Acme Fast Freight is broker

Reversing in part Division 5's decision of July, 1937, the Interstate Commerce Commission now finds that freight forwarding companies are not brokers but are common carriers at common law who are left unregulated under the Motor Carrier Act, except so far as they engage in motor vehicle operations under their own management and control, and except to the extent that indirect regulation may be accomplished by the direct regulation of the motor carriers whose services they utilize.

Commissioner Eastman wrote the majority opinion which was a report of the commission after reargument on applications of Acme Fast Freight, Inc., and its affiliates. It agrees with Division 5's findings (reviewed in the *Railway Age* of July 24, 1937) that forwarders are common carriers by motor vehicle within the meaning of the Motor Carrier Act only to the extent that they actually operate motor vehicles; and thus it affirms the grant of "grandfather-clause" certificates to two Acme affiliates—Shippers Service Express for operations over regular routes between certain points in Massachusetts and New York, and Acme Transfer & Storage Company for operations over irregular routes within an area including and adjacent to New York City. Acme had sought to cover its freight-consolidating operations with a certificate "to operate over irregular routes as a common carrier of property, except commodities in bulk, by utilization of the facilities and services of carriers by motor, rail and water, between points in all states and the District of Columbia." However, its prayer was in the alternative, requesting a contract-carrier permit or a license to operate as a broker if its operations were found to fall within those classifications, and not to be those of a common carrier.

In mentioning the implications of its present decision, which leaves the forwarders unregulated, the commission recognized that "there is need for the adequate public regulation of such forwarding companies." It adds, however, that "legislation directed particularly to such companies is necessary for adequate and effective public regulation of their activities." It will deal with that subject in its forthcoming report in No. 27365, Freight Forwarding Investigation.

Commissioner Eastman, who, as stated above, authored the present report, last year filed a separate opinion as a member of Division 5, disagreeing with the Division's finding that Acme and its non-vehicle-operating affiliates were brokers. Commissioner Caskie who with Commissioner Lee comprised Division 5's majority is now a dissenter in part. He thinks that the functions performed by Acme "are literally and actually those of a broker"

as defined in the Motor Carrier Act; and "that definition of a broker being clear and explicit, in determining its meaning there is no occasion to resort to rules of construction or to the history of this legislation." Also, Mr. Caskie calls the further finding of the majority that forwarders are common carriers at common law *"obiter dictum"* which "might well be ignored except for the implication which the report conveys that legislative recognition of these applicants as common carriers and regulation of their activities as such would be in the public interest."

The majority report, Mr. Caskie goes on, "seems definitely to commit the majority to the conclusion that there is urgent need for adequate public regulation of applicants and other forwarding companies as common carriers. I do not concur in that conclusion. It presupposes that forwarding companies, such as these applicants, are indispensable parts of the national transportation system, and that, with some modification of existing practices and rate adjustments, the functions which they perform can not be undertaken and satisfactorily performed by existing recognized common carrier transportation agencies. Statutory recognition and regulation of forwarding companies as common carriers would needlessly increase the existing plethora of common carrier transportation agencies, and permanently impose on the general shipping public the burden of supporting both the carriers and the forwarders without any resulting public benefits." Commissioners Mahaffie and Lee did not participate in the disposition of the proceeding.

The majority report opens with a reference to Division 5's findings, pointing out that no one disputes those with respect to Shippers Service Express and Acme Transfer & Storage Company. It then takes up Acme's contention that the Division was in error in finding that the applicant, apart from the two affiliates above mentioned, is not a common carrier by motor vehicle and that it is a broker. After a brief description of Acme's freight-consolidating operations, the majority expresses its agreement with the applicant's claim that it is a common carrier at common law; and then proceeds to dispose of the contention that it is a common carrier by motor vehicle as defined in the act.

Acme disputed Division 5's adverse finding in the latter connection on three grounds. It claimed that its collection and delivery operations were analogous to those of the railroads; that it exercised more control over the line-haul carriers it employed than indicated by Division 5; and that "in any event it is unnecessary, in order to be a 'common carrier by motor vehicle' that the carrier 'actually physically operate the vehicle or control the management and conduct of those who conduct the operation.'" This third ground, the report observes, "is much the broadest and would, if sustained, make it unnecessary to consider the others." Proceeding on that basis the commission measures the claim against pertinent sections of the Motor Carrier Act and finds itself "unable to avoid the conclusion" that the motor vehicle operations of forwarding companies which are included within the statutory definition of "common carriers by motor vehicle" are "operations of motor vehicles in the transportation of property for compensation on public highways which are conducted and directed by forwarding companies under their own management and control, and are not operations of motor vehicles which are conducted and directed by independent motor carriers which furnish service to the forwarding companies."

In the discussion leading to the foregoing conclusion the commission observes at one point that a railroad operating from New York to Chicago does not acquire the status of a railroad operating from Chicago to San Francisco because it undertakes as an initial carrier to accomplish the transportation of a shipment from New York to San Francisco; "nor, if the interchange were made with a steamship company, would the initial railroad acquire the status of a carrier by water."

The two other grounds upon which Acme disputed Division 5's refusal to accord it common-carrier-by-motor-vehicle status are disposed in brief references to the record which was found to have been accurately appraised by the Division. Then comes the reasoning in support of the reversal of Division 5's finding that Acme is a broker.

The Division, the report says, "disregarded the essential nature of a forwarding company, such as applicant."

"The term 'forwarding company'", it goes on, "is a loose description which is applied to concerns of quite different types. There are 'forwarding companies' which do no more than arrange for transportation for their principals, who in the end have direct contractual relations with the carriers. Such 'forwarding companies' are brokers, but they differ essentially from the concerns, such as applicant, which offer and assume responsibility for a complete common carrier service. . . .

"The language used in the definition, and the context, are persuasive that a 'broker' was conceived of as an intermediary between the shipper or traveler and the carrier, i.e., as one who brings the two parties together, arranges for the transaction, between them, and charges for the service which he so performs. . . . .There is nothing whatever to indicate that when the act was under the consideration of Congress, any one entertained the idea that the provisions with respect to brokers were designed to apply, or would apply, to nationwide carloading or forwarding companies, like applicant."

After setting forth its findings the report goes on to additional discussion of the arrangements between Acme and motor carriers which handle its traffic, and Acme's desire to pay them on a basis different from their published rates. It is the commission's "present view" in this connection that the shipments for which forwarders assume responsibility "cannot lose their identity as shipments in common carriage at any stage of the transportation service which the forwarding company undertakes to provide, and that they are not, therefore, shipments which can lawfully be transported by a motor contract carrier."

Accounting Division Officers

Due to the fact that the Accounting Division, A. A. R., is having no convention this year, the present officers and committee members will carry over, serving another year. Likewise, committee dockets will be kept open until the 1939 meeting, and two years' committee recommendations will be acted upon at that time. A brief interim report of committee activities will shortly be sent to accounting officers by the secretary of the division. The current chairman of the division is T. F. Darden, vice-president, A. C. L. Next year's meeting will, in all probability, be held at Toronto during June.

I. C. C. Approves Burlington Purchase

The Interstate Commerce Commission, Division 5, has authorized the purchase by the Burlington Transportation Company, a subsidiary of the Chicago, Burlington & Quincy, of the operating rights and property of Roy A. Sand, doing business as the Sand Motor Express. The route purchased extends between Bettendorf, Iowa, and St. Louis, Mo., via Davenport, Moline, Galesburg, Bushnell, Rushville, Beardstown, Jacksonville, White Hall, and Alton, Ill., approximately 260 route miles. The Burlington company would receive the vendor's operating rights and nine motor vehicles. The sale is subject to the determination of the vendor's "grandfather" rights by the commission.

Cotton Belt Bonds Not Payable in Dutch Guilders

The United States Circuit Court of Appeals, in an opinion handed down at St. Louis, Mo., on July 13, affirmed a district court decision that first term and unifying bonds of the St. Louis Southwestern were payable for their face amount of $21,638,000 and that the provision making them payable in Dutch guilders, worth about $37,000,000 in United States currency, was invalid under the Congressional resolution of June 5, 1933. The court held that the resolution of Congress was for the purpose of maintaining uniform power of every dollar, both in the market and in payment of debts, by striking down all private obligations requiring payment in a particular kind of coin or currency.

Twenty-Fifth Anniversary of the Railway Educational Bureau

A testimonial dinner in celebration of the twenty-fifth anniversary of the Railway Educational Bureau was held on the evening of June 30 at the Union Station in Omaha, Neb., in honor of D. C. Buell, director. The Bureau was founded by E. H. Harriman of the Union Pacific System in 1909 and in 1913 D. C. Buell took over the operation as a private concern and offered the service to all railroad employees in the United States. Among the guests at the dinner were H. R. Safford, senior executive assistant of the Missouri Pacific, Houston, Texas; H. E. Dickinson, general superintendent, Chicago & North Western, Omaha, Neb., and Eugene McAuliffe, president of the Union Pacific Coal Company. The dinner was given and

attended by all Bureau employees and their guests. Richard C. Buell, son of the founder of the Bureau, acted as toastmaster. He has been associated with the Bureau for the past four years as special representative and was recently made assistant to the director.

Trunk Line Appeal Warehouse Case

An appeal has been docketed in the United States Supreme Court by seven eastern trunk lines—the Baltimore & Ohio, Central of New Jersey, Delaware, Lackawanna & Western, New York Central, Erie, Pennsylvania and Lehigh Valley—asking that court to reverse the decision of a three-judge court in the southern district of New York sustaining the decision of the Interstate Commerce Commission in Ex Parte 104, part 6, which pertained to the rental received by these carriers from shippers occupying space in railroad warehouses in the New York harbor district. The railroads had asked the three-judge court to enjoin the commission's order in the so-called warehouse case, but the court refused to take such action.

P. W. A. Funds for Waterway

President Roosevelt has approved a $600,000 allotment of Public Works Administration funds to the War Department's Corps of Engineers for the widening of the channel in the Calumet and Little Calumet rivers in Illinois. The announcement by Public Works Administrator Harold L. Ickes says that "funds available before the allocation from the P. W. A. were only enough to complete widening of the channels to 220 ft. With additional funds the channel will be widened to 300 ft., the full project width. This full channel width is required by the large water-borne commerce in this area. The waterway is a connecting link in the Great Lakes to the Gulf of Mexico waterway and will afford better navigation facilities for traffic than in the congested area of Chicago."

N. J. Roads Protest 1938 Taxes

Six New Jersey carriers have filed an appeal with the State Board of Tax Appeals against tax levies for 1938 totaling $20,364,053, charging undue discrimination as contrasted with other property holders and a basic fallacy in the state's principle of taxing railroad property. Hearings will be held on September 14. Five of the roads, the New York Central, Lehigh Valley, Central of New Jersey, Lackawanna and Erie, together with their subsidiaries, have indicated their intention to withhold over $5,000,000 of the tax payment. These roads have already withheld a total of $29,581,000 from payment on levies for the years 1932 to 1937, inclusive. Decisions on appeals taken to federal district and circuit courts with regard to tax levies for 1932 to 1936, inclusive have not yet been announced.

Ask Ships Not to Delay "400"

The Chicago & North Western, in anticipation of train delays that may be caused when the Hudson draw bridge over the St. Croix river near Hudson, Wis., is placed in operation this summer, has requested ship operators to time their signals so that the opening of the bridge will not delay the "400," the North Western Limited and other trains. The unusual request has already resulted in the receipt of a large number of letters offering co-operation. The request, illustrated with an "old salt" and a balloon enclosing the words "calling all ships," reads—"This summer the Hudson draw bridge may swing on your signal. If this occurs the moment the '400' is to cross, a very important delay occurs to a train that would be 'over the hills and far away' at faster than mile a minute clip.

"Your co-operation in timing your signal for the Hudson 'Draw' to avoid delaying the '400' will be greatly appreciated."

June Operating Revenues 19.5 Per Cent Under 1937

Preliminary reports from 88 Class I railroads, representing 78.6 per cent of total operating revenues, made public by the Association of American Railroads, show that those roads, in June, had estimated operating revenues amounting to $222,719,145 compared with $276,604,850 in the same month of 1937 and $352,803,288 in the same month of 1930. The June gross was 19.5 per cent below that of June, 1937, and 36.9 per cent below June, 1930.

Freight revenues of the 88 roads in June, amounted to $173,905,196 compared with $219,479,849 in June, 1937, and $262,667,664 in June, 1930—20.8 per cent below the former, and 33.8 per cent below 1930. Passenger revenues in June, 1938, according to the preliminary reports, totaled $29,024,632 compared with $31,806,265 in June, 1937, and $55,468,708 in June, 1930—8.7 per cent below the former and 47.7 per cent below the same month in 1930.

New Century Carries Twenty Per Cent More Passengers

The newly-equipped Twentieth Century Limited, which the New York Central placed in operation between New York and Chicago on June 15, enjoyed a rise of 20 per cent in the number of passengers carried in its first full month of operation, as against the same period last year, according to L. W. Landman, general passenger traffic manager.

"We expect," said Mr. Landman, "that as business conditions improve, this percentage of increase will be heightened materially. The increase in passengers from Chicago to New York has been particularly marked, having almost doubled that of a year ago. This is attributed in part to the later departure time from Chicago, made possible by the new 16-hour schedule."

Denver & Salt Lake Enters Colorado Tax Case

The Denver & Salt Lake, stock of which is held by the Reconstruction Finance Corporation, has filed a suit in the federal district court at Denver, Colo., attacking the increase in railroad taxes which was voted last fall by the state board of equalization. Similar suits previously had been brought by the Union Pacific, the Chicago, Burlington & Quincy, the Colorado & Southern and the Atchison, Topeka & Santa Fe. The Denver & Rio Grande Western was ordered by the district court not to pay any taxes other than those levied by the tax commission pending a final determination of the cases. The Denver & Salt Lake offers to pay $211,798 in taxes for 1937, in contrast to the $254,070 resulting from the increase in valuation made by the board of equalization.

The North Makes Counter-Charges in Southern Rate Case

Hearings on the so-called Southern rate case, which re-opened at Buffalo, N. Y., on July 12, as reported in last week's *Railway Age*, were devoted this week largely to the testimony of the governors of northern states who sought to show that a substantial part of northern industry had already "migrated" to the southern states and that a downward revision of rates on goods shipped from the South to the North, as is proposed by Southern interests, would only serve further to upset present industrial conditions.

Governors Quinn of Rhode Island, Cross of Connecticut and Aiken of Vermont, who spoke on July 18 and 19, agreed in their statements that New England industry has already shown a marked decline. Governor Cross pointed out that the proposed revision of rates would "throw out of balance" a relationship of rates which has existed for many years and upon which the present industrial structure is built.

Charles E. Bell, independent traffic expert and formerly an executive and traffic assistant to the Federal Co-ordinator of Transportation, testifying for Northern interests, asserted that, in reality, Southern rates on some commodities, largely raw materials, are actually below those levied on similar shipments in the North. The assailed rates on finished goods are necessarily higher to balance these low rates on basic commodities and afford adequate revenues to the Southern carriers, he claimed.

A 4,000-Mile Camera Tour to Operate From Chicago

An 8-day, 4,000-mile, all-expense tour, especially planned for camera fans and sponsored by the magazine "Popular Photography," will be operated over the Chicago, Burlington & Quincy and the Great Northern from Chicago, on August 27. The tour, arranged with stop overs at several picturesque points, will pass through Maiden Rock and the Twin Cities on the Burlington; Alexandria, Fargo, Minot, Fort Peck Dam, Glasgow, Havre, Glacier National Park, Great Falls and Billings on the Great Northern; and Newcastle, Deadwood, Rapid City, Alliance, Denver and Burlington on the Chicago, Burlington & Quincy.

Trained photographers will accompany this tour and at each photographic point of interest will give advice and instruction. Groups will be formed at each stop for picture-taking explorations, and will be divided according to personal preferences or photographic ability. Each group will be under the guidance of an experi-

enced photographer. Several professional models will accompany the party. Popular Photography will award cash prizes and trophies for the best pictures taken on the tour.

To Limit Wharfage Fee Absorption at Canadian Ports

The entire amount of top wharfage charges levied on shipments at Canadian Atlantic ports will no longer be absorbed by the Canadian Pacific, the Canadian National and inland water carriers as heretofore, according to a new joint tariff, effective August 15. Herein are listed the top wharfage rates as assessed by the National Harbor board of Canada and the amounts that will be absorbed in the future by carriers party to the tariff.

The harbor board increased top wharfage charges, effective April 14. The Canadian carriers, while they absorbed the wharfage charges in the past, have found themselves unable to continue the total amount of the top wharfage charges as increased. Hence they indicated that after August 14 they will absorb the fee only to the same amount that was charged prior to April 14, with a maximum of 40 cents per net ton. The principal objection of these carriers to the new wharfage charges was that the harbor board undertook to levy rates on a measurement basis on shipments which the carriers hauled on a weight basis. According to the joint tariff, therefore, the carriers will base wharfage fees by weight only.

Would Approve Northland Greyhound Extension

Joint Board No. 95, of the Interstate Commerce Commission, has recommended in a proposed report to the commission that it authorize the extension of operations by the Northland Greyhound Lines between Milwaukee, Wis., and Green Bay, and points in the Upper Peninsula of Michigan and points intermediate, over specified routes. The company would be permitted to carry passengers and their baggage, express, mail, and newspapers. The Greyhound company proposes to operate over the following routes:

(1) Between Calumet and St. Ignace, Mich., over the following routes: From Calumet to Hancock, Mich., over Michigan State Highway 26; from Hancock to Rapid River, Mich., over U. S. Highway 41; from Rapid River to St. Ignace, Mich., over U. S. Highway 2; and from Rapid River to Escanaba, Mich., over U. S. Highway 41, serving all intermediate points; (2) Between junction of U. S. Highway 41 and Michigan State Highway 95 (near Humboldt, Mich.), and Iron Mountain, Mich., over Michigan State Highway 95; serving all intermediate points; and (3) Between Green Bay and Milwaukee, Wis., over Wisconsin State Highway 57; serving all intermediate points.

Freight Car Loading

Loading of revenue freight for the week ended July 9 totaled 501,013 cars, a decrease of 87,851 cars or 14.9 per cent below the preceding week due to the Fourth of July holiday, a decrease of 177,945 cars or 26.2 per cent below the corresponding week in 1937, and a decrease of 291,040 cars or 36.7 per cent below the same week in 1930. All commodity classifications except grain and live stock showed decreases under last week, while all commodity classifications except grain showed decreases under last year. The summary, as compiled by the Car Service Division, Association of American Railroads, follows:

Revenue Freight Car Loading

For Week Ended Saturday, July 9			
Districts	1938	1937	1936
Eastern	95,458	133,178	148,974
Allegheny	86,879	134,958	142,362
Pocahontas	33,121	43,386	47,907
Southern	75,723	88,457	93,542
Northwestern	67,473	117,283	119,223
Central Western	97,511	110,393	113,175
Southwestern	44,848	51,303	59,094
Total Western Districts	209,832	278,979	291,492
Total All Roads	501,013	678,958	724,277
Commodities			
Grain and Grain Products	56,334	46,911	59,501
Live Stock	9,896	10,094	14,626
Coal	70,545	97,368	104,109
Coke	3,833	9,805	9,116
Forest Products	20,941	32,722	31,020
Ore	20,273	74,566	54,979
Merchandise l.c.l.	123,232	140,563	163,116
Miscellaneous	195,959	266,929	287,810
July 9	501,013	678,958	724,277
July 2	588,864	802,346	649,703
June 25	558,937	769,945	713,588
June 18	555,569	752,787	690,667
June 11	553,854	750,500	686,643
Cumulative Total, 27 Weeks	14,731,315	19,719,133	17,423,938

In Canada.—Car loadings for the week ended July 9 totaled 43,346, as against 51,820 cars last year and 38,372 cars for the previous week, according to the compilation of the Dominion Bureau of Statistics.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
July 9, 1938	43,346	16,763
July 2, 1938	38,372	18,320
June 25, 1938	43,364	18,443
July 10, 1937	51,820	22,572
Cumulative Totals for Canada:		
July 9, 1938	1,179,965	563,473
July 10, 1937	1,286,527	749,159
July 4, 1936	1,168,998	633,951

Commission Orders Rerouting of Traffic

Due to the fact that the Gulf, Mobile & Northern is unwilling to accept the modification of a contract which allows it to operate its trains over the tracks of the Illinois Central between Bemis, Tenn., and Paducah, Ky., the Interstate Commerce Commission has ordered that "effective July 19, and thereafter until further order of the commission, the Gulf, Mobile & Northern and other common carriers which may be involved, divert to open routes through Jackson, Tenn., traffic which the Gulf, Mobile & Northern would have handled through the Paducah gateway, and at the rates applicable through the Paducah gateway." The order also provides that "in executing the directions of the commission the common carriers involved shall proceed without reference to directions, agreements or arrangements now existing between them with reference to divisions of the rates of transportation applicable to said traffic; that said divisions shall be, during the time that this order remains in force, voluntarily agreed upon by and between said carriers, and that upon failure of the carriers to so agree, said divisions shall be hereafter fixed by this commission in accordance with pertinent authority conferred upon it by the Interstate Commerce Act."

April Accident Statistics

The Interstate Commerce Commission's completed statistics of steam railway accidents for the month of April, 1938, now in preparation for the printer, will show:

	Month of April		4 months ended with April	
Item	1938	1937	1938	1937
Number of train accidents	418	721	1,910	3,226
Number of casualties in train, train-service and non-train accidents:				
Trespassers:				
Killed	142	162	582	658
Injured	184	220	623	677
Passengers on trains:				
(a) In train accidents*:				
Killed	....	....	3	....
Injured	28	25	143	163
(b) In train-service accidents:				
Killed	....	2	7	3
Injured	147	149	620	592
Travelers not on trains:				
Killed	....	2	1	7
Injured	67	70	278	281
Employees on duty:				
Killed	43	55	174	259
Injured	1,236	1,926	5,243	8,006
All other nontrespassers†:				
Killed	112	137	480	671
Injured	398	503	1,911	2,479
Total—All classes of persons:				
Killed	297	358	1,247	1,598
Injured	2,060	2,893	8,818	12,198

* Train accidents (mostly collisions and derailments) are distinguished from train-service accidents by the fact that the former cause damage of more than $150 to railway property.

† Casualties to "Other nontrespassers" happen chiefly at highway grade crossings. Total highway grade-crossing casualties *for all classes of persons, including both trespassers and nontrespassers*, were as follows:

Number of accidents	249	307	1,182	1,606
Persons:				
Killed	102	127	464	622
Injured	293	358	1,438	1,855

Commission Denies Increased Motor Rates In New England

The Interstate Commerce Commission, Division 5, has found unlawful proposed rates, charges, regulations, and practices for application to the transportation of property by common carriers by motor vehicle and for joint motor-water movements, in interstate and foreign commerce, (1) between points in New England and (2) between points in New England, on the one hand, and points in northern New Jersey and eastern New York, on the other. As a result the commission has ordered the suspended schedules canceled and the proceeding discontinued.

"The situation presented," says the commission's decision, "is somewhat similar to that discussed in I. & S. No. M-278, Rates in Central Territory, decided June 24, 1938, wherein we found unlawful proposed schedules which, considered as a whole, would have further aggravated a generally unsatisfactory financial condition of motor carrier rates in central territory. Here, as in the report cited, there may be some rates in the proposed schedules which will earn revenues above the cost of service plus a reasonable profit, but considered as a whole they are less than reasonable min-

ima, and therefore, are unlawful." The commission's decision on Rates in Central Territory was abstracted in the *Railway Age* for July 9, page 88.

Eastern Roads File New Passenger Tariffs

Eastern railroads filed new tariffs with the Interstate Commerce Commission on July 15 covering the recently authorized half cent increase in coach fares, to become effective July 25. At the same time the commission granted authority to the Eastern Steamship Lines, Inc., to publish on 10 days notice increased fares applying from and to New York City and Boston. It is understood that the water carrier plans to raise its fares so that they will conform to the increases being put into effect by the eastern roads on July 25.

Several reports have come to the commission from railroad ticket offices to the effect that people who make regular trips or are anticipating making a trip after the increase becomes effective are making purchases of tickets in advance of July 25 in the hopes that the railroads will honor them. In an effort to prevent this loss of revenue, the carriers filed a provision with their tariffs to the effect that "one way and round-trip coach tickets sold prior to July 25, 1938, at coach fares authorized in tariffs to which this is a supplement upon which going passage was not commenced by 4 a. m., July 25, 1938, will not be honored for passage after 4 a. m., July 25, 1938, but will be redeemed at the coach fares paid therefore." It is not known at this writing whether or not the commission will acquiesce in this provision of the new tariffs.

N. Y. Crossing Plan Passed; Roads May Pay 15 Per Cent

The railroads of New York state are to be liable for payment of up to 15 per cent of the cost of grade crossing removal work, after completion, according to the so-called Moses amendment to the state Constitution, which was passed unanimously by the 162 voting members of the state Constitutional Convention at Albany on July 18. As passed, the twice-amended amendment to the state code, originally proposed by Robert Moses, park commissioner of New York City, provides that the state shall pay, "in the first instance," the entire cost of any grade crossing elimination, construction work for which was not started before January 1, 1939, but shall be entitled to recover from the carrier or carriers involved "by way of reimbursement, the amount of the net benefit to the company or companies from the elimination and incidental improvements, the amount of the net benefit to be adjudicated, after the completion of the work in the manner to be prescribed by law, and in no event to exceed 15 per cent of the total expense of the elimination and incidental improvements." The manner and payment date of such assessments are to be prescribed later by the legislature.

As originally introduced by Mr. Moses, the proposal had stipulated that the railroads be relieved entirely of the cost of crossing removals, while as amended by G. R. Fearon, it provided that the carriers be held liable for 20 per cent of the total cost.

During the floor discussion a letter was read from President M. W. Clement of the Long Island who pledged the cooperation of his road, if the amendment were adopted, to finish plans and take up construction work in connection with the Atlantic avenue improvement in Brooklyn, N. Y., the Rockaway peninsula crossing elimination plan and the removal of the remaining crossings in Queens and of dangerous crossings in Nassau and Suffolk counties, subject to the order and approval of the Transit and Public Service commissions. A second letter was received from R. E. Dougherty, vice-president improvements and developments, New York Central, and chairman of the executive committee of the Associated Railroads of New York State, which stated that the member roads of the Association would render full co-operation in the elimination of all remaining dangerous grade crossings; this pledge, it was added, is predicated upon the fulfillment by the state of the obligations placed upon it by the amendment.

Rutland Receiver Ordered to Confer with Public On Finances

L. G. Morphy, receiver for the Rutland, has been directed by H. B. Howe, United States district judge for Vermont, to invite the official staff and employee representatives of the road, shippers, various public officials, the chambers of commerce along the line, and all other persons, to give the court and the receiver "their opinions, advice, etc., how to make income pay the cost of operations." The court's directions ordered that a hearing be held for interested parties residing south of Alburg, Vt., on July 19 in Rutland, Vt., and that a hearing for persons residing between Alburg and Ogdensburg, N. Y., be held at the court house in Malone, N. Y., on July 26.

The text of the court order reads as follows: "The earnings of the railroad are reduced so much that you will be forced to stop its operation immediately unless salaries and wages are materially reduced —probably more than the 15 per cent heretofore predicted—and the taxes materially abated—probably at least half. To stop operating a railroad over 400 miles long is so extraordinary that it isn't and won't be believed without clear and convincing evidence—a thing like this has never happened in railroading. Your official staff, the 1300 employes, the officials of the labor unions, the shippers, his Excellency, Gov. Aiken, his tax commissioner, Hon. Erwin M. Harvey, his Excellency, Gov. Lehman, his tax officials, the townships along the railroad, and the public should be accurately informed in detail of this approaching peril to business and the public welfare."

6,260 New Freight Cars Installed In First Six Months

Class I railroads in the first six months of 1938 installed in service 6,260 new freight cars, according to an announcement by the Association of American Railroads. In the same period last year 34,187 new freight cars were put in service, and in the same period in 1936 there were 11,604.

The railroads, in the first half of 1938, also put in service 132 new steam locomotives, compared with 166 in the same period in 1937 and 18 in the same period in 1936. New electric and Diesel locomotives installed in the first six months of this year totaled 72 compared with 20 in the same period last year and 11 two years ago.

Class I railroads on July 1 this year had 5,021 new freight cars on order, compared with 42,624 on July 1, 1937, and 28,089 on July 1, 1936. On June 1 this year 4,484 new freight cars were on order. New steam locomotives on order on July 1 totaled 37, compared with 301 on July 1 last year and 67 on the same date two years ago. The railroads had 56 new steam locomotives on order on June 1 this year. New electric and Diesel locomotives on order on July 1 totaled 26, compared with 33 on July 1, 1937, and 23 on July 1, 1936. The railroads on June 1 this year had six new electric and Diesel locomotives on order.

New freight cars and locomotives leased or otherwise acquired are not included in the above figures.

Wheat Movement Profitable

While the loadings of winter wheat from the Southwest are as yet between one and two thousand cars lighter on each of the principal grain carrying railroads, indications are that the total number of cars handled will exceed last year's figure before the season ends. For the first time since the introduction of the combine method of harvesting winter wheat, the annual rush for cars and transportation is not confined to a few weeks this year. Instead, because of the acreage on which combine harvesting was impossible after the heavy rains had beaten down the grain, the movement will be spread out over a much longer period this year. A large proportion of the wheat crop had to be harvested by the thresher and binder method, or even mowed by hand, both of which methods eliminate the dumping of wheat on the railways as soon as it is harvested under the combine method. In Oklahoma this year, less than 50 per cent of the crop has been harvested by combines, as compared with over 80 per cent last year.

The elimination of the violent peak periods of the past several years has resulted in all the wheat-handling lines showing decreases in loadings to date as compared with last year. All crop estimates, which at this late date can be made accurately, indicate that the total wheat loadings will be much larger than last year. Thus the railways will earn more for transporting the grain, not only because of the increased loadings but because the crop can be handled without the necessarily large expenditures and costs of delayed trains that were inevitable during the concentrated peak periods of previous years. While the heavy rains in eastern Kansas reduced the yield per acre materially in that section, a much greater acreage was planted this year in western Kansas, Texas and Oklahoma, and particularly in the

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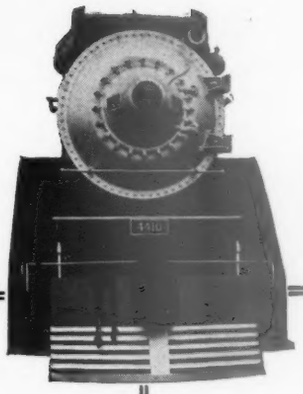
MODERN LOCOMOTIVES MEAN...



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Increased power at high speeds

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Fuel economy

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Lower maintenance

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Higher operating standards

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Greater gross earnings

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Increased net profits

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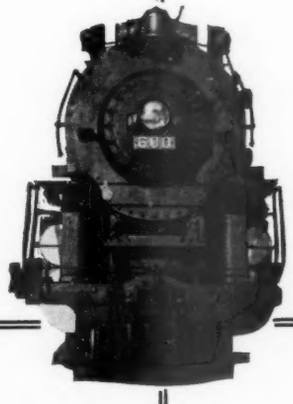

LIMA LOCOMOTIVE WORKS

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"dust bowl" area of those states. Adequate rainfall in the dust territory insured the first real crops in some years in that area and brought the total production beyond last year's crop, despite the failure of eastern Kansas to measure up to last year's standards.

Last year a dangerously low "cushion" of stored grain cars prior to the opening of the shipping season had no ill results only because most of the wheat moved to inland elevators, permitting a quick turn-around of cars. This year plenty of cars were available for pre-season storage because of the suspension of the average per diem plan; slack conditions in general business; and complete co-operation and mutual assistance between the railways and the Car Service division. Because of the adequate pre-season car supply and the lengthening of the shipping season, no difficulty is being experienced in providing cars for wheat loading, even though, this year, the movement to Kansas City, to Galveston for export and to other points requiring a longer turn-around for cars is much greater than it was last year.

Prospects for loadings of spring wheat are also encouraging. Harvesting has started in Nebraska, where a good crop was cut last year and a better crop is expected this season. For the first time in four years, drought and dust have been absent from the Dakotas, with the result that a large crop is expected in areas that have been almost non-productive for some years past.

Report on H. & M. Fare Case

The Interstate Commerce Commission's action in rejecting the Hudson & Manhattan's plea for a 10-cent fare on its Hudson Terminal line, while authorizing a boost from six to eight cents, was based on the majority's conviction that under the latter rate "the revenue results to the respondent, especially over an extended period of time, would be more favorable." The majority opinion, written by Commissioner Porter, follows generally the proposed report of Examiner Irving L. Koch which was issued in May.

Mr. Porter describes H. & M. operations, facilities and finances, finding that the principal reason for the road's financial difficulties lies in the substantial loss of passenger traffic since 1929. The depression is cited as the chief cause of this loss, although other factors have been "the improvement in shopping and amusement centers in New Jersey, the coincidence of the five-day working week, the decline as a shopping center of Sixth avenue in Manhattan served directly by respondent between Eighth street and Thirty-third street, and the development of a new business center on Fifth avenue extending as far north as Fifty-seventh street, which is readily accessible to motor vehicles."

The report discusses at some length the H. & M.'s traffic arrangements with the Pennsylvania and notes the protestants' point that it has "failed to effect joint arrangements, somewhat like those maintained between it and the Pennsylvania, with the Lackawanna and the Erie and perhaps, through extension of its rails, with the Baltimore & Ohio, the Central of New Jersey and other railroads." Later comes the suggestion that if the H. & M. "should feel impelled" to seek revenue beyond that realized from the eight-cent fare "it should consider doing so on interline traffic."

The eight-cent fare, it is calculated, would increase the 1938 net income available for bond interest to a point where it would represent a return of 3.4 per cent on the basis of H. & M.'s original cost and 3.31 per cent on the basis of the depreciated reproduction cost new.

Commissioner Miller's brief dissenting opinion, to which Commissioner Mahaffie subscribed, said that the majority decision was based upon a fear that a 10-cent fare would result in a material diversion of traffic. He thought, however, that the H. & M. was "entitled to assume this risk;" and that the commission had "no right to substitute our judgment in this respect for that of the management of the respondent."

Says Stock Yard Is Subject to Act

(*Continued from page 165*)

stock yard companies located at other points where the circumstances and conditions in connection with the loading and unloading services were alleged to be similar to those obtaining at the company's yard. This petition was denied by the commission. On January 15, 1937, the company again proposed to cancel its tariffs.

The evidence at the hearings on this proposed cancellation was virtually the same as that at the earlier hearings with the exception that the company attempted to introduce evidence to show the conditions of stock yards at points other than Chicago. The examiner refused to admit this evidence, but he allowed the company to state for the record the nature of the evidence which it desired to introduce. Subsequent to the close of the hearings, the company petitioned the commission to overrule the examiner on this point, but this, the commission refused to do on the ground that the question of whether the company was subject to the act must be determined upon consideration of the facts and circumstances pertaining to that company and that the question of the status of other stock yards throughout the country was not material to the issue in this proceeding.

Chairman Splawn thinks that it is appropriate, however, to refer to one fact of record which was brought out in both this and the 1935 proceeding. In the case of the United States v. the Union Stock Yard, decided by the Supreme Court in 1912, the court found the company to be a common carrier subject to the Act. In the 1935 case the company contended that the court's finding was based upon the existence of an intercorporate relationship between it and the Chicago Junction Railway (then operator of the railroad) effectuated by stock control of both companies held by the New Jersey holding company; that by reason of the sub-lease and lease in 1922 of the railroad properties to the Chicago River (which is now operating them), the Stock Yards Company has ceased to be affiliated with a company operating a railroad and, in effect, that with the cessation of such affiliation, its services of loading and unloading livestock had ceased to be common carriage subject to the Act. By the lease, the company contended that it had divested itself of the status of a common carrier by railroad.

But Chairman Splawn also pointed out that under the terms of the lease, the company covenants that any time it may be called upon by its lessees to do so it will exercise its charter powers as a railroad to condemn any lands needed in connection with the operation of the leased property and that it will keep alive its charter powers as a railroad during the term of the lease in order to preserve its powers of eminent domain. In view of this agreement, the majority of the commission does not believe that the company could accomplish such a divestiture by contract. "Looking to the substance of the 1922 lease", said Chairman Splawn, "we are of the opinion and find that it did not accomplish any change in the status of the Yard Company under the Interstate Commerce Act."

Commissioner Aitchison concurred in the decision on the assumption that the ruling of the commission on the admissibility of the company's evidence regarding other stock yards was the law of the case. "However", he declared, "I believe the objection to the testimony offered should have been overruled, as it appears to me to be relevant and material. What the decision would be with the proffered evidence before us can not now be determined."

Commissioner Meyer dissented for the reasons stated in his dissent in the 1935 case. Commissioner Eastman was of the opinion that the issues in this case will not be set to rest until it is passed upon by the Supreme Court. He does not think that the company is now a common carrier by railroad and points out that past decisions of the Supreme Court that it was such a carrier rested upon its conjunction in ownership, operation, and service with a line of railroad. Such conjunction ceased, he observed, when the line of railroad was leased, practically in perpetuity, to the New York Central.

Commissioner Eastman also believes that there is a fear which underlies the majority's decision that unless the commission can regulate the charges of the company, it will exact from the railroads exorbitant compensation which will, in turn, afford the railroads a reason for demanding an increase in their line-haul rates on livestock to Chicago. He also is of the opinion that this fear is not a reason for finding that the company is a carrier by railroad, but suggests that the case "only goes to show that a situation exists which may be in need of remedy, perhaps by further legislation."

Mr. Eastman also directs the majority's attention to the fact that under this decision, part of the company's activities will be regulated by the commission and part by the Secretary of Agriculture under the Packers & Stockyards Act. He believes that it would be much preferable for the commission to allow the Secretary to regulate all the company's activities. He also

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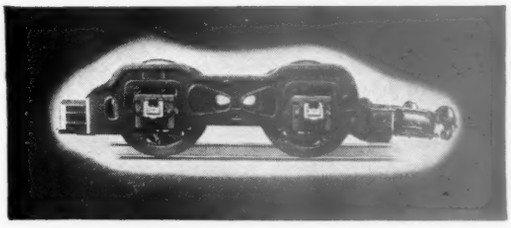

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NEW YORK CHICAGO MONTREAL

differed with the majority regarding the admissibility of certain evidence, saying that he thought the commission in error for refusing to admit evidence regarding the conditions surrounding stock yards in other cities than Chicago.

Commissioner Porter wrote a lengthy dissent in which he held that he could find no evidence which showed that the company performed any duties which would make it a common carrier by railroad. Commissioner Lee did not participate in the disposition of the case.

American Builders of a Brazilian Jungle Road to Re-unite

American railroad men who were employed in the building of the Madeira-Mamore railroad (Brazil) are planning to hold re-unions in New York and San Francisco, Cal., during the fairs to be held in each city in 1939. Some 14,000 workers from the United States were engaged in the building of the 203-mile one-meter-gage "Jungle Route" between 1907 and the year of completion, 1913. The road, which was built entirely in the deep Brazilian jungles to afford a by-pass around rapids in the Madeira and Mamore rivers, lies slightly south of the Equator and is approximately 500 miles from the nearest city, Manaos on the Amazon. The first efforts toward its building made by Col. Church of Philadelphia, Pa., in 1878, were soon thwarted by jungle fever and lack of money. The second attempt of 1907 was successful. The road was handed over to the Brazilian government in 1931.

E. A. Smith, Newportville, Pa., is secretary of the Madeira-Mamore Association.

Middle Atlantic States Truck Rate Hearing Opens

Hearings on the Interstate Commerce Commission's investigation of motor truck rates in Pennsylvania, Maryland, Delaware, New Jersey and New York, docketed as Ex Parte MC-20, opened at the Benjamin Franklin hotel, Philadelphia, Pa., on July 18, before Examiner Johnston. During the testimony by representatives of the Middle Atlantic States Motor Carrier Conference, Inc., it was brought out that net losses of $995,000, after all charges, were suffered during 1937 by 149 motor truck companies in the middle Atlantic area and that, in addition, these highway carriers have lost $326,447 thus far this year.

J. P. Faherty, of the Baltimore Transfer Company, in commenting on the results of rate regulation by the I. C. C., declared that since such regulation, truck operating expenses have increased about 10 per cent while revenue has increased 20 per cent.

D. T. Waring, of the Middle Atlantic States Motor Carrier Conference, Inc., had previously advised member carriers and interested shippers that the Conference would make recommendations at the rate hearing urging, in general, the adoption of class rates on a level similar to that of railroad freight charges, with provision for modification at a later date. The recommendations would include also provisions for uniform rules regarding loading and wharfage charges, pick-up and delivery fees, "exclusive use of truck" privileges, minimum truck-load weights, minimum charges for single shipments, and diversion and reconsignment rates.

A. E. Hodkinson appeared as an observer for the railroads' Trunk Line Association.

Construction

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—A contract has been awarded to the Okes Construction Company, Minneapolis, Minn., for the construction of a 30-ft. addition to three stalls of this company's roundhouse at St. Paul, Minn., consisting of new concrete pits, brick walls on pile foundation and a frame roof. The total cost of this work will be approximately $30,000.

CHICAGO, ROCK ISLAND & PACIFIC.—A contract has been awarded the List & Weatherly Construction Co., of Kansas City, Mo., for the construction of a double 10 ft. by 10 ft. reinforced concrete box culvert 102 ft. long to be built two miles west of Stinnett, Tex., on this company's Liberal-Amarillo line. This box, which will cost about $20,000, will replace a 12-panel pile trestle approximately 34 ft. high. The grading will be done by company forces.

CHICAGO, ROCK ISLAND & PACIFIC.—A contract has been awarded the List & Weatherly Construction Co., of Kansas City, Mo., for the erection of a bridge in connection with a grade revision project about 1½ miles west of Bureau, Ill. The bridge will consist of five 45 ft. double track I-beam concrete ballasted deck spans on concrete piers and abutments. The track is to be raised about seven feet above the old grade in the vicinity of the bridge. The total cost of this grade revision will be approximately $175,000. The grading in connection with this project is being done by railroad forces.

STATEN ISLAND RAPID TRANSIT RAILWAY COMPANY (BALTIMORE & OHIO SUBSIDIARY).—The State of New York has received a P. W. A. grant to aid in the elimination of seven grade crossings on the Staten Island Rapid Transit Railway between Great Kills and Huguenot, Staten Island, N. Y., inclusive, at a cost of $2,136,000. A P. W. A. grant has also been approved covering the elimination of eight grade crossings through Tottenville, S. I. Ground breaking ceremonies to begin the Great Kills work were held on July 13. The first work to be done on both projects will involve the construction of detour and other temporary tracks by railway company forces. The railroad will probably ask for bids on the first contract in the early part of September.

WABASH-ANN ARBOR.—Contracts have been awarded the Ross & White Co., Chicago, Ill., for the construction of automatic, electric, direct engine coalers at East Switch, Iowa and Owosso, Mich.

Supply Trade

The Nordberg Manufacturing Company, Milwaukee, Wis., has completed arrangements with **La Consolidada, S. A.,** Calzada de la Ronda, Apartado 81, Bis., Mexico, D. F., for the sale and service in Mexico for its complete line of power tools, crushers and screens for maintenance work.

Charles M. Griffith, vice-president in charge of trackwork sales, has retired from active participation in business affairs of the **Taylor-Wharton Iron & Steel Company,** High Bridge, N. J., after more than 50 years of continuous service. Mr. Griffith will, however, be available in a consulting and advisory capacity. His former duties will be assumed by **J. A. Krugler,** general sales manager of the company.

S. L. Poorman, assistant manager, at New York, of the **Westinghouse Air Brake Company,** has been promoted to eastern manager, with headquarters as formerly at New York. Mr. Poorman's

S. L. Poorman

engineering and commercial experience has extended over a period of 25 years, during which time he has served as test engineer, mechanical expert, representative and assistant manager. He has participated in the activities that have to do with the application of air brakes to all forms of railway transportation.

OBITUARY

J. Alexander Brown, vice-president and manager of the Railway Equipment and Publication Company, publishers of The Pocket List of Railroad Officials, Official Railway Equipment Register and Railway Line Clearances, who died at Caldwell, N. J., on July 10, as was reported in the *Railway Age* of July 16, was born in New York City on May 4, 1854. Mr. Brown first entered the publishing field with Poor's Publishing Company. He was manager of the Pocket List of Railroad Officials since that publication was established in 1895, and in 1909 he was elected vice-president of the company which office he also held until the time of his death. In 1905 Mr. Brown served

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NO. 64 OF A SERIES OF FAMOUS ARCHES OF THE WORLD

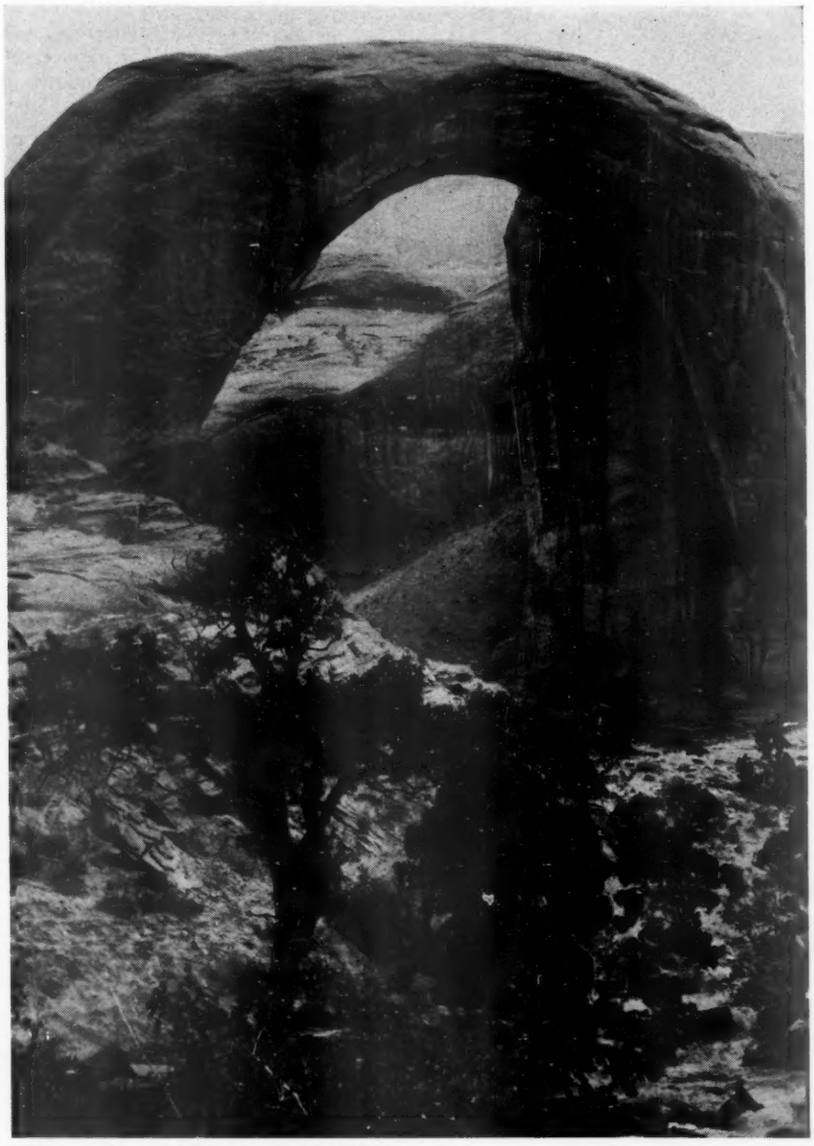

Photo courtesy of Milwaukee Public Museum

RAINBOW NATURAL BRIDGE, UTAH

The Rainbow Bridge of Utah claims distinction as the largest natural bridge in the world. Its total height at the middle of the span is 307 feet. The span is 278 feet in width, making of the arch an almost perfect semi-circle. » » » The Security Sectional Arch design is the result of long experience and careful study by the American Arch Company engineers. Its development paralleled locomotive development. Today it is an essential factor in the successful operation of high speed, high capacity trains.

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as secretary and director of exhibits of the American Railway Appliance Exhibition held in Washington, D. C., in connection with the International Railway Congress, and the U. S. Government ap-

J. Alexander Brown

pointed him a delegate to the International Railway Congress held in Berne, Switzerland, in 1910. Mr. Brown was one of the founders of the Railway Supply Manufacturers' Association and for many years served as one of the directors of that association.

Equipment and Supplies

PASSENGER CARS

THE NEWFOUNDLAND RAILWAY has ordered 1 dining car and 2 sleeping cars from the National Steel Car Corp.

THE BOARD OF TRANSPORTATION, CITY OF NEW YORK, will receive bids until 11:30 a. m. (d. s. t.) September 13 at room 609, 250 Hudson street, New York, for the purchase of 11 service cars. In the *Railway Age* of June 11, page 987, it was reported that the board contemplated buying this equipment.

LOCOMOTIVES

Pennsylvania Orders $3,400,000 of Electrical Equipment

The Pennsylvania has given contracts totaling $3,400,000 to the Westinghouse Electric & Manufacturing Co. and the General Electric Company for electrical equipment (each company to furnish equipment costing $1,700,000 for 10 locomotives) to be installed in the 20 new electric locomotives recently ordered from the railroad's shops at Altoona, Pa., as was reported in the *Railway Age* of June 11, page 987.

CENTRAL OF BRAZIL.—Negotiations are under way with manufacturers in the United States for the purchase of 26 locomotives and 1,000 freight cars. Inquiries by this road for locomotives and freight cars were reported at various times during 1937 in the *Railway Age*.

THE WHEELING & LAKE ERIE is inquiring for five locomotives of the 2-8-4 type.

THE BOSTON & MAINE has taken delivery of three 600-hp. Diesel-electric switching locomotives from the Electro-Motive Corporation.

IRON AND STEEL

THE SEABOARD AIR LINE has ordered 4,500 tons of rail and accessories from the Tennessee Coal, Iron & Railroad Company.

SIGNALING

ATLANTIC COAST LINE.—Bids will be received by this road at its offices in Wilmington, N. C., until 12 o'clock noon, August 6, for furnishing the necessary materials for the installation of flashing light highway crossing signals at Speed, Edgecombe county, N. C., and Raynham, Robeson county, N. C. F. H. Fechtig is purchasing agent, at Wilmington.

CHICAGO & NORTH WESTERN.—Bids will be received at the offices of this road in Chicago until 2 p. m. (c.s.t.) August 10, for furnishing the materials for two railroad grade crossing flashing light signal installations to be installed under the Federal grade crossing program in the State of Wyoming. C. T. Dike is vice-president and chief engineer of the railroad at Chicago.

MOTOR VEHICLES

Greyhound Lines

The Greyhound system issue of a total of $4,200,000 of equipment notes recently authorized to 13 units of the Greyhound system by the Interstate Commerce Commission to finance the purchase of 356 new buses, with authority given to the Greyhound Corporation to assume obligation as guarantor and endorser with respect to $3,552,000 of the notes, which was reported in the *Railway Age* of July 16, page 120, includes amounts to the various units as follows:

Atlantic Greyhound Corp.	$480,000
Capitol Greyhound Lines	72,000
Central Greyhound Lines, Inc.	180,000
Central Greyhound Lines, Inc., of New York	276,000
Dixie Greyhound Lines, Inc.	300,000
Illinois Greyhound Lines, Inc.	72,000
New England Greyhound Lines, Inc.	120,000
Northland Greyhound Lines, Inc.	480,000
Ohio Greyhound Lines, Inc.	60,000
Pacific Greyhound Lines	720,000
Pennsylvania Greyhound Lines, Inc.	720,000
Southwestern Greyhound Lines, Inc.	480,000
Teche Lines, Inc.	240,000
Total	$4,200,000

THE BOSTON & MAINE has received delivery of five 37-passenger buses from the American Car & Foundry Motors Company.

THE MAINE CENTRAL TRANSPORTATION COMPANY has received delivery of four 37-passenger buses from the American Car & Foundry Motors Company.

Financial

CENTRAL VERMONT. — *Abandonment.* — This company has asked the Interstate Commerce Commission for authority to abandon a branch line extending from South Barre, Vt., to Williamstown, 3.9 miles.

CHICAGO & NORTH WESTERN.—*Reorganization.*—The Railway Labor Executives' Association has filed with the Interstate Commerce Commission a brief asking for further hearing in this proceeding, or the elimination of the proposal to lease the properties of the Chicago, St. Paul, Minneapolis & Omaha to the C. & N. W. Other briefs have been filed by the Bank of New York as trustee under the Milwaukee, Sparta & North Western's first mortgage; and the City Bank Farmers Trust Company as trustee under the first and refunding mortgage of the C. & N. W.

CHICAGO & NORTH WESTERN.—*Reorganization.*—Briefs in this company's reorganization case have been filed by the United States Trust Company of New York, trustee under the general gold bond mortgage of 1987; George W. Bovenizer, Charles F. Batchelder and John E. Rovensky, as a committee representing certain institutional holders of collateral notes of this company; New York Trust Company as successor trustee under the first mortgage of the Sioux City & Pacific; a protective committee for holders of common stock; and the Irving Trust Company, as trustee under the first mortgage of the Milwaukee & State Line.

Briefs have also been filed by the Railroad Credit Corporation, Reconstruction Finance Corporation, Chemical Bank & Trust Company of New York, and the Life Insurance Group and the Savings Bank Association.

KANSAS & SIDELL.—*Abandonment.*—The Interstate Commerce Commission, Division 4, has authorized this company to abandon its entire line extending from Hume, Ill., to Kansas, 19.4 miles.

KANSAS, OKLAHOMA & GULF.—*RFC Loan.*—The Interstate Commerce Commission, Division 4, has dismissed the application of this company for a $600,000 loan from the Reconstruction Finance Corporation. The company had previously asked the commission for authority to withdraw the application.

MISSOURI PACIFIC.—*Lease of K. H. & P.*—This road has applied to the Interstate Commerce Commission for authority to lease the properties of the Kiowa, Hardtner & Pacific—a 10.4-mile line extending from Kiowa, Kans., to Hardtner.

NEW YORK, NEW HAVEN & HARTFORD.—*Rejection of Lease.*—Federal Judge C. C. Hincks, at New Haven, Conn., signed an order under date of July 20 ordering the trustees of the Old Colony to disaffirm the road's lease from the Boston & Providence. The lease dates from April 1, 1888, and provides for a rental equal to the interest on funded debt, dividends of 10 per cent

Continued on next left-hand page

"An increase from 200 to 275 lb. pressure, which may be considered typical, along with an increase of 100 to 150 deg. in steam temperature, has produced an increase in effective output for approximately the same input of nearly one-third. * * * The Type "E" superheater has been the agency by which the effective increase in steam temperature has taken place."

—Railway Mechanical Engineer
June, 1938

ELESCO

Higher degrees of superheated steam are only one of the advantages of the Elesco Type "E" locomotive superheater . . . the other is an increase in the evaporative capacity of the boiler. The Elesco Type "E" superheater design, which uses small diameter tubing, provides more superheating surface and more evaporating surface. This makes for high sustained boiler capacity with highest boiler efficiency, which is possible only with small diameter superheater tubing and small flues.

The SWING is decidedly toward high sustained boiler capacity with highest boiler efficiency . . . as provided by Elesco Type "E" superheaters.

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on the outstanding capital stock and $3,000 yearly for organization expenses.

ST. LOUIS SOUTHWESTERN. — *Interest Payment.*—The semi-annual interest of $400,000, which became due on May 1 on $20,000,000 of first mortgage bond certificates of the St. Louis Southwestern, will be paid following a ruling made by the United States district court at St. Louis, Mo., on July 15. On July 1, the court ordered the trustees to pay the interest, but payment was held up because bondholders contended that the first mortgage of the St. Louis Southwestern is defective and that the interest should not be paid. The court ruled that a guarantee by the Cotton Belt to pay the bonds of the subsidiaries was secured by the lien of the mortgage, and that, therefore, the interest on all of the certificates was a direct Cotton Belt obligation. He also sustained the position that all issues with respect to the mortgage had been adjudicated in the 1936 order. He concluded that the only issues presented were whether there was sufficient cash on hand to make the payment, and whether payment would be in the best interest of the trust estate. He found in the affirmative on both questions.

SEABOARD AIR LINE.—*Equipment Trust Certificates.*—The receivers have applied to the Interstate Commerce Commission for authority to assume liability for $1,675,875 of receivers' equipment trust certificates. The issue will bear interest at the rate of four per cent and will be divided into a Class A and a Class B division, with the Class A certificates maturing in installments of $16,000 on the first of each month beginning September 1, 1944, up to and including December 1, 1946. All Class B certificates will mature on February 1, 1947. The Class A Certificates will comprise $1,508,000 of the issue.

SOUTHERN.—*Bonds.*—This company has asked the Interstate Commerce Commission for authority to issue $4,500,000 of first consolidated mortgage five per cent bonds, due July 1, 1994, to repay a like amount of East Tennessee Reorganization Mortgage five per cent bonds of the Southern maturing September 1, 1938.

SOUTHERN.—*RFC Loan.*—This company has applied to the Reconstruction Finance Corporation for an extension of loans totaling $12,475,204 from September 1, 1938, to September 1, 1943; and for a new loan of $11,795,000 for the same period, making a total application of $24,270,204. The new loan will be used to retire $4,500,000 of the Eastern Tennessee Reorganization 5's and $7,295,000 of Southern Railway's Mobile & Ohio 5's.

WABASH.—*Interest Payment.*—Receivers will on July 25 pay the unpaid balance of 20 per cent due on May 1, 1937, interest on the company's first mortgage 5 per cent bonds.

Average Prices of Stocks and Bonds

	July 19	Last week	Last year
Average price of 20 representative railway stocks..	29.37	27.87	53.49
Average price of 20 representative railway bonds..	60.77	60.00	80.71

Railway Officers

EXECUTIVE

R. E. Davies, assistant to the president of the Minneapolis, St. Paul & Sault Ste. Marie at Minneapolis, Minn., has been appointed assistant to the trustees.

FINANCIAL, LEGAL AND ACCOUNTING

I. J. Terroba, general auditor of the National Railways of Mexico at Mexico, D. F., has been appointed to the newly created position of general accountant and comptroller and **J. Ramirez Gamez,** assistant to the general auditor has been appointed auditor of passenger receipts and assistant general accountant and comptroller. **G. Lopez Espino,** assistant to general auditor has been appointed assistant general accountant and comptroller.

Charles Francis Taylor, whose retirement as auditor of revenues of the Chesapeake & Ohio at Richmond, Va., was reported in the *Railway Age* of July 9, was born on February 4, 1866, at Richmond. He entered railroad service on January 8, 1884, with the Chesapeake & Ohio as messenger, becoming clerk the following year and chief clerk to the auditor of freight traffic in 1897. From January 1 to March 1, 1920, Mr. Taylor was assistant auditor of freight traffic and on the latter date he was appointed auditor of freight traffic. On July 1, 1932, he was appointed auditor of revenues, the position he held until his retirement.

Thomas Edgar Jenks, whose appointment as auditor of revenues of the Chesapeake & Ohio at Richmond, Va., was reported in the *Railway Age* of July 9, was born on August 16, 1892, at Richmond. Mr. Jenks entered railroad service with the Chesapeake & Ohio as messenger on August 27, 1909. He served in various clerical capacities until his promotion to assistant chief clerk to auditor freight traffic on October 1, 1922. On June 16, 1924, he was appointed assistant auditor freight traffic and became assistant auditor of revenues on July 1, 1932, when the office of auditor of freight traffic and auditor of passenger traffic were consolidated.

Henry Leland Hazlewood, auditor of disbursements of the Chesapeake & Ohio at Richmond, Va., has had his jurisdiction extended over the office of the auditor of capital expenditures, as noted in the *Railway Age* of July 9. Mr. Hazlewood was born on July 26, 1891, at Richmond, and entered railroad service with the Chesapeake & Ohio on April 26, 1906, as clerk in the office of passenger receipts. He became an accountant in the valuation department on September 28, 1914; clerk to corporate auditor on November 5, 1918; accountant in the comptroller's office on March 1, 1920; chief clerk to auditor of capital expenditures on December 1, 1921; chief clerk to auditor of disbursements on January 16, 1934; and assistant auditor of disbursements on May 1, 1936. Mr. Hazlewood was appointed auditor of disbursements on February 1, 1937, and on July 1, 1938, his jurisdiction was extended over the office of the auditor of capital expenditures.

Lilburn Hartley Moseman, whose retirement from the position of auditor of station accounts of the Chesapeake & Ohio at Richmond, Va., was reported in the *Railway Age* of July 9, was born on November 16, 1863, at Gallia county, Ohio. Mr. Moseman entered railroad service on December 15, 1883, with the Scioto Valley (now Norfolk & Western). In 1888 he went with the Adams Express Company and served as clerk and massenger at Indianapolis, Ind., and Columbus, Ohio. Mr. Moseman was appointed yard clerk for the Chesapeake & Ohio at Huntington, W. Va., in April, 1890, becoming operator and station clerk at Charleston, W. Va., the next month. In February, 1893, he was appointed freight agent at Charleston, leaving the service in May, 1903, because of ill health. Mr. Moseman was appointed traveling auditor for the Chesapeake & Ohio at Richmond in September, 1905, and on April 1, 1920, he was appointed auditor of station accounts, the position he held until his retirement.

Arthur Lee Mattern, who has retired as auditor of capital expenditures of the Chesapeake & Ohio at Richmond, Va., as noted in the *Railway Age* of July 9, was born on October 22, 1873, at Richmond. He entered railroad service on May 25, 1891, with the Chesapeake & Ohio and served in various clerical capacities until June, 1907, when he became clerk in the accounting department of the Colorado & Southern at Denver, Colo. He re-entered the service of the C. & O. on July 1, 1909, as clerk in the office of the auditor of disbursements and remained in that position until January 15, 1913, when he became bookkeeper for a private industry. On September 1, 1913, he re-entered the service of the C. & O. as clerk in the office of the auditor of passenger accounts. The following month he was appointed chief clerk in the valuation department, in which position he served until March 1, 1920, when he was transferred to the office of the auditor of disbursements in charge of additions and betterments work. On December 1, 1920, Mr. Mattern was appointed assistant auditor of disbursements and on September 1, 1927, he became auditor of capital expenditures, which position he held until his retirement.

Frank Day Hodgson, whose retirement as assistant to comptroller of the Chesapeake & Ohio at Richmond, Va., was reported in the *Railway Age* of July 9, was born on November 2, 1865, at Covington, Ky. He entered railroad service on August 4, 1881, with the Ohio & Mississippi as clerk in the accounting department at Cincinnati, Ohio, later becoming traveling auditor. When the road was taken over by the Baltimore & Ohio Southwestern he continued in that position and later became freight and ticket accountant, serving in this position until the road was

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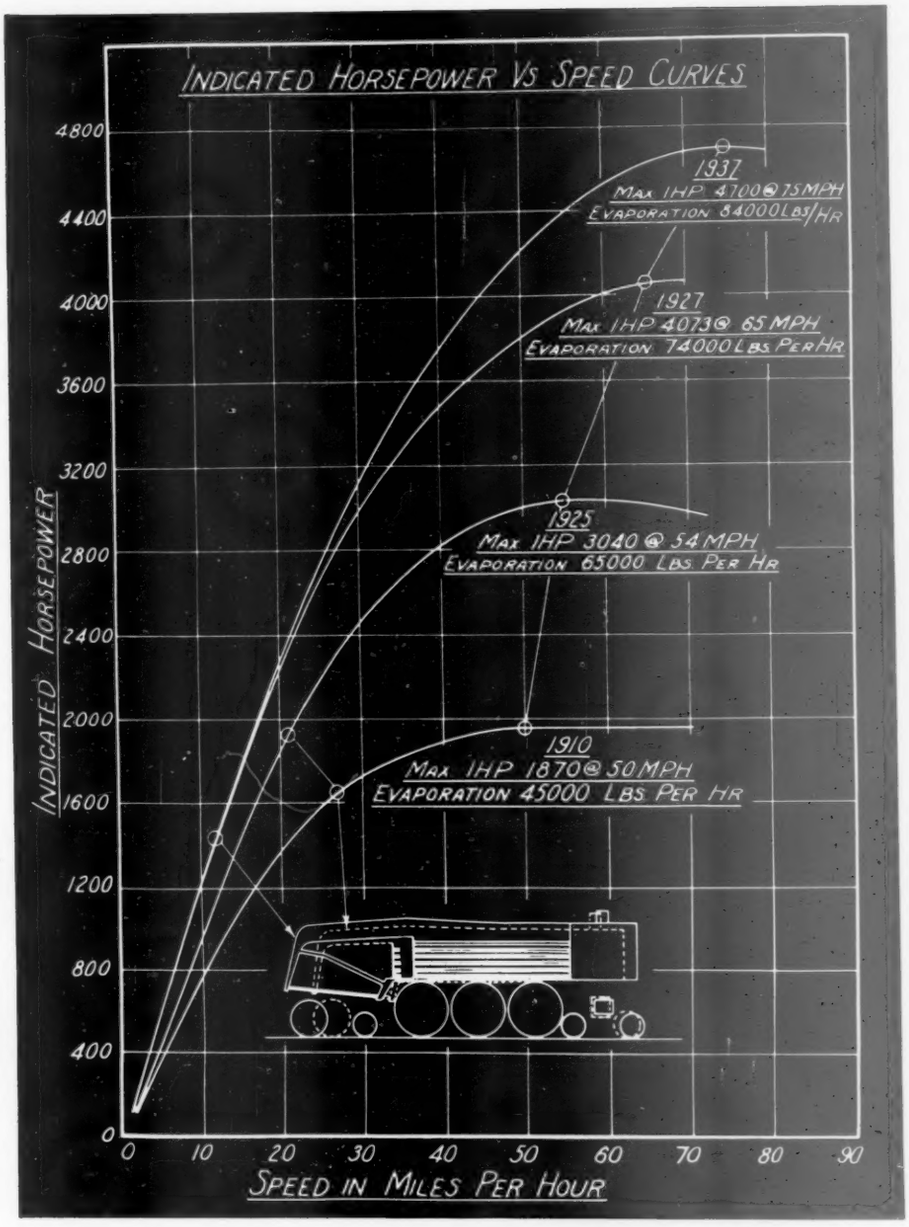

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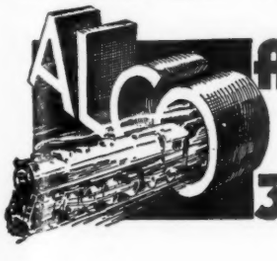
150% More Horsepower—50% Higher Speed

STEAM locomotive development within the last 20 years is strikingly illustrated by the growth of passenger motive power on a railroad which has utilized four outstanding designs during this period. The original type was the Pacific, or 4-6-2. The total weight was about 270,000 pounds with 171,500 pounds on drivers. Starting tractive effort was 30,900 pounds; indicated horsepower about 2,000; boiler pressure 200 pounds per sq. in. and drivers 79 inches in diameter.

The three succeeding classes of locomotives retained the three driving axles. Weight was slightly increased and weight on drivers remained approximately the same. Tractive effort, and particularly horsepower, however, have continuously gone up as shown in above curves. The important improvement to be noted is that the maximum power in each later development was reached at a higher speed than its predecessor.

With general dimensions, excepting boiler pressures, practically the same, the power has increased 15 per cent; and with the same number of driving axles and approximately the same weight on drivers, the power has increased 150 per cent.



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taken over by the Baltimore & Ohio on July 1, 1900, when he was transferred to Baltimore, Md., as freight accountant of the B. & O. He later became assistant auditor of revenues in charge of merchandise freight accounts of that road, serving until September 1, 1903, when he resigned. On February 15, 1905, he reentered railroad service as special accountant of the "Great Central Route" (which then included the Chicago, Cincinnati & Louisville) at Cincinnati, Ohio, and became auditor of the C. C. & L., on May 22, 1905, serving at Cincinnati and Chicago, successively. On July 1, 1910, when that road was acquired by the Chesapeake & Ohio of Indiana he became auditor of the latter company. He served in this position until the road was taken over by the Chesapeake & Ohio in May, 1911, when he was transferred to Richmond, Va., as auditor of miscellaneous accounts. On June 1, 1912, he was transferred to Columbus, Ohio, as auditor of the Hocking Valley and its subsidiaries, becoming comptroller on September 16, 1918, and served in the latter capacity until the road was taken over by the C. & O. on July 1, 1930, when he was transferred to Richmond as assistant to comptroller, the position he held until his retirement.

Jewett Frederick Andrews, who has been appointed auditor of station accounts and overcharge claims of the Chesapeake & Ohio at Richmond, Va., as reported in the *Railway Age* of July 9, was born on

J. F. Andrews

September 29, 1891, at Staunton, Va. Mr. Andrews entered railroad service on April 1, 1905, with the Chesapeake & Ohio, as operator and agent on the Clifton Forge division and on May 1, 1913, became clerk in the freight office at Staunton. He became traveling auditor on November 1, 1916, and after war service, returned to this position in March, 1919. Mr. Andrews was appointed chief clerk to the auditor of station accounts on October 1, 1921, and manager of the zone accounting bureau, at Richmond, on March 1, 1926. He was appointed assistant auditor of station accounts on January 1, 1937, the position he held until his recent appointment.

R. Murray Hunter, who has been appointed assistant to comptroller of the Chesapeake & Ohio at Richmond, Va., as reported in the *Railway Age* of July 9, was born on December 7, 1876, at Appomattox, Va. Mr. Hunter received his education at Randolph Macon College and entered railroad service with the Southern at Charlottesville, Va., where he remained from August, 1896, to August, 1902. On December 8, 1902, Mr. Hunter entered the service of the Chesapeake & Ohio and served successively as clerk, rate clerk, chief of revision and in June, 1908, became chief of revision and overcharge claims. He was appointed assistant auditor freight traffic on January 1, 1920, and became auditor overcharge claims on June 1, 1924, which position he held until his recent appointment as assistant to comptroller.

R. M. Hunter

OPERATING

G. W. Rourke, assistant to the general manager of the Chicago, Rock Island & Pacific at Kansas City, Mo., retired July 1.

W. H. Henderson, inspector of service, Western Region of the Pennsylvania, has been appointed also assistant train master of the Toledo division, with headquarters at Detroit, Mich.

A. W. Baker, trainmaster on the Erie with headquarters at Youngstown, Ohio, has been promoted to superintendent of the Kent division at Marion, Ohio, succeeding **F. J. Tamplin,** who has been assigned to other duties.

W. N. Preston, assistant trainmaster on the Eastern Kentucky division of the Louisville & Nashville, with headquarters at Lexington, Ky., has been promoted to trainmaster on the Louisville division, with headquarters at Louisville, Ky., succeeding **S. S. Wilkerson,** retired.

G. B. Gowen, assistant superintendent of the Rutland, has been appointed superintendent, with headquarters as before at Rutland, Vt., and will have jurisdiction over the entire system. The positions of general manager and assistant superintendent, with headquarters at Rutland, have been abolished.

J. O. Hackenberg, general manager of the Pennsylvania-Reading Seashore Lines, with headquarters at Camden, N. J., has also been appointed superintendent of the Atlantic division, Eastern region, Pennsylvania railroad, and of the Philadelphia & Camden Ferry Company, succeeding **B. H. Hudson,** retired.

Juan C. Garcia has been appointed superintendent of the Queretaro division of the Mexican National Railways, succeeding **Carlos Kramer B.,** who has been transferred to the Center division succeeding **Pablo M. Hernandez,** who has been appointed relief superintendent, with headquarters at Mexico City.

S. J. Frazier, assistant superintendent transportation of the St. Louis-San Francisco with headquarters at Springfield, Mo., has been promoted to assistant to general manager with the same headquarters, and **A. M. Ball,** assistant superintendent at Springfield has been advanced to assistant superintendent transportation, succeeding Mr. Frazier.

James N. Petersen, whose appointment as supervisor of the personal record bureau of the Chicago, Milwaukee, St. Paul & Pacific at Chicago was announced in the *Railway Age* of July 16, was born in Chicago on April 5, 1890, and entered railway service as a messenger and yard clerk in the Chicago terminal of the Milwaukee on October 6, 1905. In October, 1906, he was transferred to the local freight office at Chicago, and on November 1, 1917, he was promoted to statistician in the general superintendent's office at that point. Mr. Petersen was advanced on December 1, 1919, to chief clerk of the personal record bureau, the position he held at the time of his recent promotion.

Benjamin H. Hudson, superintendent of the Atlantic division of the Pennsylvania, and also of the Pennsylvania-Reading Seashore Lines, with headquarters at Camden, N. J., has retired from active transportation service. Mr. Hudson's railroad career began as a transitman on the Central of Georgia in November, 1890, and later he was advanced to the position of assistant engineer. He resigned to become engineer in charge of construction work on the Seaboard Air Line, between Columbia, S. C., and Jacksonville, Fla. Mr. Hudson entered the service of the Pennsylvania in May, 1895, at Grand Rapids, Mich., as a track supervisor on the Grand Rapids & Indiana (now part of the Pennsylvania) and was transferred to Petoskey, Mich., in 1899. In March, 1904, he was appointed division engineer of the Southern division of that road at Fort Wayne, Ind., being advanced to superintendent of that division on August 1, 1905. He retained that position until March 1, 1920, when he was appointed superintendent of the Fort Wayne division of the Pennsylvania's main line. The following year he was transferred as superintendent to the Logansport division, and in April, 1927, he was assigned as superintendent to the Sunbury division (now known as the Wilkes Barre division) with headquarters at Sunbury, Pa. He was transferred in the same capacity to the Atlantic division of the P. R. R. at Camden on December 1, 1929, and on July 15, 1933, was also appointed

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HUNT-SPILLER *Air Furnace* GUN IRON castings are very close to the finished sizes because manufactured under scientific foundry control.

To the storekeeper this means lower transportation costs and maximum amount of useable material for every dollar thus expended.

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HUNT-SPILLER *Air Furnace* GUN IRON

superintendent of the Pennsylvania-Reading Seashore Lines.

TRAFFIC

F. W. Houston, agent of the Chicago, Milwaukee, St. Paul & Pacific at Clinton, Iowa, has been promoted to general agent at Cedar Rapids, Iowa, succeeding **J. L. Coffey,** who has retired.

ENGINEERING AND SIGNALING

M. Ceballos has been appointed chief engineer of the National Railways of Mexico with headquarters at Mexico, D. F., succeeding **F. Sanchez,** who has resigned.

Michael Lipman, division engineer of the Maryland division of the Pennsylvania, with headquarters at Wilmington, Del., has been transferred in the same capacity to the Delmarva division, with headquarters at Cape Charles, Va., succeeding **P. X. Geary. Spencer Danby,** division engineer of the Baltimore division, with headquarters at Baltimore, Md., has been appointed division engineer of the new Maryland division.

MECHANICAL

J. W. McAuley, locomotive foreman on the Canadian National with headquarters at Prince Rupert, B. C., has been promoted to the newly created position of assistant superintendent and master mechanic of the Smithers division with headquarters at Prince George, B. C.

PURCHASES AND STORES

George A. Stinchfield has been appointed acting storekeeper of the Maine Central and the Portland Terminal, with headquarters at Waterville, Me., succeeding **H. P. Richardson,** deceased.

W. E. Evans, purchasing agent of the Grand Trunk Western, with headquarters at Detroit, Mich., has been appointed general tie and timber agent of the Canadian

W. E. Evans

National, with headquarters at Montreal, Que., succeeding the late **G. P. MacLaren. G. B. Findlay,** chief clerk in the tie and timber department has been appointed assistant to the general tie and timber agent at Montreal. **T. P. Harris,** assistant purchasing agent at Montreal, has been appointed purchasing agent at Detroit, to succeed Mr. Evans.

Walter Edgar Evans was born in Montreal, on April 17, 1888, and began his railway career in that city on September 6, 1906, as a clerk in the purchasing department of the Grand Trunk. Ten years later he became accountant and in April, 1920, was appointed chief clerk and accountant. In April, 1923, Mr. Evans was appointed assistant fuel agent at Toronto, Ont., and in September of that year became chief clerk to the vice-president in charge of purchases and stores at Montreal. In May, 1924, he became assistant to the general purchasing agent and on January 1, 1927, Mr. Evans was appointed purchasing agent at Detroit for the Grand Trunk Western, the position he held until his recent appointment.

Thomas Percival Harris was born in Bristol, England, on October 26, 1896, and entered the service of the Grand Trunk in

T. P. Harris

July, 1911. He left in February, 1915, to enlist in the Canadian Expeditionary Force and on demobilization in May, 1919, Mr. Harris returned to the purchasing department.

OBITUARY

W. A. Stepp, trainmaster and chief dispatcher of the Columbus & Greenville, with headquarters at Columbus, Miss., died at that point on July 4.

Noah Johnson, roadway engineer-valuation, in charge of valuation work on the Wabash with headquarters at St. Louis, Mo., died in the Wabash Hospital at Decatur, Ill., on July 9.

Thomas Oliver Edwards, retired general auditor of the Southern Pacific, died at San Francisco, Cal., on July 13, from bronchial pneumonia, after an illness of two weeks. Mr. Edwards retired in 1932, after a railroad career of 52 years.

Frank Elwood Briggs, retired auditor coal and coke accounts of the New York Central, died on July 13 while on a vacation in Maine. Mr. Briggs entered the service of the New York Central in the freight auditing office in October, 1883. After successive promotions, he became chief clerk, and on February 1, 1910, was appointed auditor freight accounts. On February 1, 1922, Mr. Briggs was appointed auditor coal and coke accounts, which position he held until his retirement in July, 1928.

John D. Wright, who retired in 1933 as district passenger agent of the New York Central, with headquarters at New Haven, Conn., died on July 13 at St. Raphael's hospital of pneumonia, at the age of 75.

M. R. Feeley, master mechanic of the Delaware, Lackawanna & Western, with headquarters at Scranton, Pa., died on July 19. Mr. Feeley entered railroad service with the Lackawanna in 1904 as machinist apprentice at the Kingsland, N. J. shops. He completed his apprenticeship in 1908, and was appointed assistant foreman shortly afterward. In March, 1912, he was appointed engine foreman at Secaucus, N. J., and in the following December he was promoted to general foreman at Kingsland shops. Mr. Feeley was advanced to general enginehouse foreman at Hoboken, in December, 1916, and seven years later he was appointed master mechanic at Scranton.

T. W. McCarthy, who until his retirement in June, 1931 was superintendent of motive power of the First district of the Chicago, Rock Island & Pacific at Des Moines, Iowa, died on July 13 at Denver, Colo. Mr. McCarthy was born at Dunkirk, N. Y., on April 27, 1862, and entered railroad service in 1883 on the Union Pacific. He later served with the Wheeling & Lake Erie and the Wabash, and was appointed general foreman on the Rock Island at Shawnee, Okla., in 1906. On that road he served as master mechanic on the Arkansas, Panhandle-Indian Territory, Kansas and Cedar Rapids-Minnesota divisions, and as superintendent of motive power of the First district at Des Moines from 1926 until his retirement in 1931.

William Hall, formerly general machine shop foreman on the Chicago & Northern and for many years secretary-treasurer of the International Railway General Foremen's Association, passed away at his home in Winona, Minn., June 20, at the age of 81 years. Mr. Hall was born July 12, 1856, in Bromsgrove, England, and came to the United States in 1880. He had been an employee of the Chicago & North Western for 42 years, retiring from active service in 1922. He served as general machine shop foreman at Escanaba, Mich., in 1912, and as erecting shop foreman at Winona, Minn., from 1914 until the date of his retirement.

Mr. Hall was one of the organizers and a charter member of the International Railway General Foremen's Association and served as secretary-treasurer from 1906 to 1937, or almost during the entire existence of the association. He was interested in school affairs and served as a member of the Winona Board of Education for 12 years, being president of the board for three terms.